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STUDIES IN RHEUMATIC FEVER

I. THE PHYSIOLOGIC EFFECT OF SODIUM SALICYLATE ON THE HUMAN BEING, WITH PARTICULAR REFERENCE TO THE PROTHROMBIN LEVEL OF THE BLOOD AND THE EFFECT ON HEPATIC PARENCHYMA

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UNITED STATES NAVAL RESERVE

In the course of many years the therapeutic usefulness of salicylates has become well established. With dosages within reasonable limits, the untoward reactions which sometimes have developed always have been of minor importance. Recently, however, several papers and editorials have appeared which suggest that even with relatively small doses of salicylates the tendency to hemorrhage is increased; this tendency is indicated by the fall in the prothrombin content of the blood and, in some instances, by an increase in the blood coagulation time.[1]

During the treatment of large numbers of young adults with active and inactive rheumatic fever hemorrhagic tendencies have been noted infrequently in this hospital, and even when this tendency has occurred it did not appear to be correlated with the administration of salicylates. This broad clinical impression was so divergent from those results recently reported that a control study was undertaken to determine primarily the effect of salicylates administered orally on the level of prothrombin in the blood. Secondarily it was thought useful also to correlate the salicylate level in the blood with any change in prothrombin levels that might occur and to observe the effect of such salicylate levels on the liver, sedimentation rate, blood count and renal function.

PLAN OF STUDY AND METHODS

The group for study comprised 113 young men who were afflicted with rheumatic fever. The large majority of these patients at the start of the study had inactive rheumatic fever and were ambulatory; a small group (22) were having a recurrence of active polycyclic rheumatic fever at the start of the study or had one during the study. All of the 113 patients were given the same general diet furnished by the Navy and all except those who were confined to bed were allowed to continue their usual routine activities under military supervision. Arbitrarily the 113 patients were divided into two groups. One group of 57 served as controls. The remaining 56 were given varying daily doses of salicylates for four weeks, while the 57 control patients were given orally only sodium bicarbonate in varying doses during the same period of time.

During the first week the 56 patients who received salicylates were given 25 grains (1.6 Gm.) of sodium salicylate orally together with 10 grains (0.65 Gm.) of sodium bicarbonate twice daily; the controls received only 10 grains of sodium bicarbonate twice daily. The medication given to both groups during the four weeks is listed in the accompanying table. No medication was administered during the fifth week to either group of patients except for a few who still remained ill.

During the study 5 of the 56 patients receiving salicylates had to discontinue their medication and were dropped from the study. Two of the 5 developed acute appendicitis, 1 required confining disciplinary action and 2 developed severe nausea and vomiting. The results, therefore, are based on study of only 51 patients who received salicylates. Only 3 of the controls had to be eliminated from the study. One of the 3 required an operation for severe cellulitis of the leg, 1 required disciplinary action and, after careful study of the third, it was decided that the correct diagnosis was rheumatoid arthritis and not rheumatic fever. The final results concerning the controls represent data from 54 patients.

The prothrombin content of the blood was measured by modification of the method first proposed by Quick in which the prothrombin time of whole plasma is measured in seconds.[2] During the course of this experiment more than 1,500 prothrombin times were determined and certain observations were made that would be evident only in such a large group. The factors of

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Ensign W-V(S) Rosalie Ruth Ryan, U.S.N.R., supervised and aided in the laboratory procedures used in this study, and Ruth F. Stribey, HA2/c, U.S.N.R., aided in making the charts.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the United States Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Meyer, O. O., and Howard, Beryl: Production of Hypoprothrombinemia and Hypocoagulability of the Blood with Salicylates, Proc. Soc. Exper. Biol. & Med. **53:** 234-237 (June) 1943. Shapiro, Shepard: Studies on Prothrombin: VI. The Effect of Synthetic Vitamin K on the Prothrombinopenia Induced by Salicylate in Man, J. A. M. A. **125:** 546-548 (June 24) 1944. Shapiro, Shepard; Redish, M. H., and Campbell, H. A.: Studies on Prothrombin: IV. The Prothrombinopenic Effect of Salicylate in Man, Proc. Soc. Exper. Biol. & Med. **53:** 251-254 (June) 1943.

2. Magath, T. B.: A Method for Determining the Prothrombin Clotting Time, in Walters, Waltman, and Snell, A. M.: Diseases of the Gallbladder and Bile Ducts, Philadelphia, W. B. Saunders Company, 1940, pp. 563-564.

time, room temperature and kind of thromboplastin used were found to be extremely important. Determinations on normal controls were done at the beginning, middle and end of the series of determinations on the two groups of patients. On one or two occasions it was necessary to record a longer normal prothrombin time for the half of our group of patients whose tests were run last. The prothrombin times on the patients receiving sodium salicylate were always determined before those on the "control" patients. This procedure lessened any effect of greater lapse of time on the prothrombin time of this group of patients. Experiments showed that on a typical hot southern California day the prothrombin time was lengthened from one to four seconds if the plasma stood for two hours, and if the plasma was allowed to stand even longer the prothrombin time was proportionately increased. Stored plasma from the plasma bank showed no prothrombin activity. The source of thromboplastin used for the tests varied. From June 14 to June 25, 1944 dried rabbit brain prepared by Magath's method was employed. From June 26 to July 7 Bacto Thromboplastin as prepared by the Difco Laboratories was

Plan for Administration of Drugs

Time	Control Group	Patients Given Sodium Salicylate
First week	10 grains (0.65 Gm.) of sodium bicarbonate 2 times a day	10 grains of sodium bicarbonate plus 25 grains (1.6 Gm.) of sodium salicylate 2 times a day
Second week	10 grains of sodium bicarbonate 4 times a day	10 grains of sodium bicarbonate plus 25 grains of sodium salicylate 4 times a day
Third week	10 grains of sodium bicarbonate every 4 hours day and night	10 grains of sodium bicarbonate plus 25 grains of sodium salicylate every 4 hours day and night
Fourth week	10 grains of sodium bicarbonate every 4 hours day and night	10 grains of sodium bicarbonate plus 30 grains (2 Gm.) of sodium salicylate every 4 hours day and night
Fifth week	No medication	No medication

used, and from July 8 to July 26 fresh rabbit lung prepared by the method outlined in the "Clinical Chemistry Notes of the Naval Medical School" was employed. These frequent changes in source of thromboplastin were undesired but forced by necessity of obtaining material. Diluted plasma (12.5 per cent) was tried, but the rather indefinite end point led us to discard this method. To rule out individual variations in so-called normals, our daily normal values were determined from the blood from two or three members of the laboratory staff.

The sedimentation rate was measured by the method of Westergren. Liver function was measured by the intravenous sulfobromophthalein method;[3] the blood samples were taken at intervals of five and thirty minutes after injection of 2.5 mg. of sulfobromophthalein per kilogram of body weight. The serum bilirubin was measured by the method of Malloy and Evelyn[4] and the van den Bergh reaction by the method described by Kolmer and Boerner.[5]

3. Rosenthal, S. M., and White, E. C.: Clinical Application of the Bromsulphalein Test for Hepatic Function, J. A. M. A. **84:** 1112-1114 (April 11) 1925.

4. Malloy, Helga T., and Evelyn, K. A.: The Determination of Bilirubin with the Photoelectric Colorimeter, J. Biol. Chem. **119:** 481-490 (July) 1937.

5. Kolmer, J. A., and Boerner, Fred: Approved Laboratory Technic: Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological, ed. 3, New York, D. Appleton-Century Company, Inc., 1941, p. 234.

The method outlined by Brodie, Udenfriend and Coburn[6] was used for the determination of blood salicylates. A few minor changes were made to allow the work to be done more conveniently in the necessarily large volumes of the experiment. It was more convenient to use serum rather than the plasma recommended by the authors. A large series of comparative studies on the salicylate content of plasma and serum was run and the difference of + or — 2 mg. per hundred cubic centimeters was considered insignificant. Owing to the difficulty of obtaining a large supply of Pyrex glass stoppered bottles, an attempt was made to find an adequate substitute. The common 4 ounce "French Square" bottle with a bakelite screw cap was highly satisfactory and is in wide use in pharmacies. The inner layer of cork and paraffin in the bottle cap must be removed before use. Screw caps of plastics other than bakelite are dissolved by ethylene dichloride and therefore cannot be used. The ordinary Kahn shaker in use in most clinical laboratories is adequate for shaking the mixture and has the additional advantage of holding thirty-six to fifty bottles.

There is no loss of salicylates by allowing the blood to stand overnight, and the procedure may be interrupted at any point for a considerable length of time. Ethylene dichloride is toxic and should be used only with forced ventilation. Since ethylene dichloride should not be pipetted, a tapered small graduated cylinder holding 30 cc. was found suitable for measuring the chemical for the purpose of the test.

In ten days prior to the start of the study all 113 patients had the routine tests just described. The prothrombin time was determined three times and the sedimentation rate twice during this period. All prothrombin times were well within normal limits. The sedimentation rates of a few patients were elevated. During the four weeks of the study the concentration of hemoglobin, number of erythrocytes and leukocytes, urinalysis, dye retention test, serum bilirubin and van den Bergh reaction were determined once weekly on the 51 patients who were receiving sodium salicylate. The Quick prothrombin time was determined three times a week, as were the sedimentation rate and the level of salicylate in the blood. All studies were carried out only once a week on the 54 controls.

In the course of the study of the 105 patients it was observed that some of the subjects were not taking the medicaments properly in spite of strict supervision. This fact was easily determined by observing the blood salicylate levels of these patients. In another study in which the primary purpose was to determine the effect of the administration of sodium bicarbonate on the level of salicylates in the blood the prothrombin time was watched closely. In this group of 9 patients supervision of medication was extremely strict and all 9 patients received the prescribed medications. They were given 150 grains (10 Gm.) of sodium salicylate daily for three weeks either with or without sodium bicarbonate. The Quick prothrombin time and blood salicylate level were determined daily except on Sundays on these 9 patients. The results on this group will be mentioned in connection with the results of the study of prothrombin content of the blood.

6. Brodie, B. B.; Udenfriend, Sidney, and Coburn, A. F.: The Determination of Salicylic Acid in Plasma, J. Pharmacol. & Exper. Therap. **80:** 114-117 (Jan.) 1944.

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In order to correlate our results with the recent work of others we reviewed the literature on the various points we were studying and have compared the pertinent observations of others with our observations.

COMPARISON OF RESULTS OF OUR STUDY WITH DATA FROM LITERATURE

Prothrombins.—In February 1943 Link and his associates[7] at the University of Wisconsin reported in their continued studies on hemorrhagic sweet clover disease that the quantitative chemical degradation product of dicumarol was salicylic acid.[8] This finding prompted these workers to study the effect of salicylates on the prothrombin level of the blood in rats. They found that a single dose of salicylic acid induced a temporary hypoprothrombinemia in rats when the rats were maintained on a ration low in vitamin K. This phenomenon did not occur when the rats were on a diet containing sufficient vitamin K. Furthermore, menadione protected the rat against the hypoprothrombinemic producing action of salicylic acid. It was observed that a dose of 25 mg. of sodium salicylate administered intravenously to rats on a diet deficient in vitamin K increased the prothrombin time of diluted plasma (12.5 per cent) from a normal of 39 to 72 seconds. In addition, it was found that on the low vitamin K ration rats receiving 100 mg. of salicylic acid daily developed severe hypoprothrombinemia in twenty days. Rats on the artificial ration, which was extremely low in vitamin K, developed a temporary mild hypoprothrombinemia even after single oral doses of 10, 25 or 100 mg. of salicylic acid.

Shortly after this report, two studies appeared which indicated that salicylates administered to man had an effect on the prothrombin level similar to that observed originally by Link and his associates in rats. Meyer and Howard reported that the prothrombin level of most of 13 subjects who received 80 grains (5.3 Gm.) of acetylsalicylic acid daily for periods of three to eleven days was reduced to about 50 per cent of normal, and in addition the coagulation time increased from an average control level of 18 to 25 minutes. These authors usually noted an effect on the prothrombin level the day after the first administration of the drug, but in most instances the maximal effects were not observed until the drug had been administered for three or four days or more. When administration of the drug was discontinued, the prothrombin level and coagulability of the blood usually returned to normal in from two to four days. From 75 to 80 grains (5 to 5.3 Gm.) of sodium salicylate was administered to 6 patients in divided doses for periods of seven to eight days and 40 grains (2.6 Gm.) in divided doses to three others for periods ranging from three to eight days. The effects on the prothrombin and coagulation time were similar in all respects to those of acetylsalicylic acid. It was noted further that the administration of menadione would protect the persons receiving salicylates from hypoprothrombinemia. Similar observations were made by Shapiro also, who reported that from his clinical studies approximately 1 mg. of synthetic vitamin K would counteract the prothrombinemic inducing action of 1 Gm. of acetylsalicylic acid.

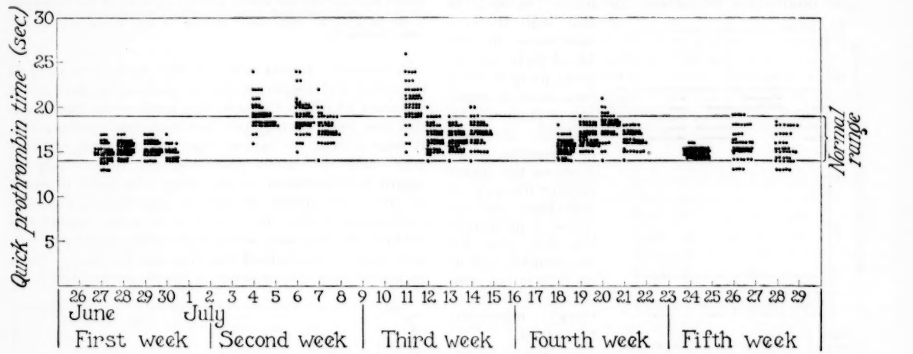

Chart 1.—Effect of progressively higher dosages of sodium salicylate on the prothrombin time of the blood of 51 patients who had rheumatic fever.

Since the appearance of these two clinical studies, several editorials have pointed out that the administration of salicylates might not only be a factor in production of hemorrhagic manifestations among patients with rheumatic fever who are receiving salicylates but also might account for some of the unexplained hemorrhages that occur in acetylsalicylic acid addicts.

In chart 1 is demonstrated graphically the effect of the administration of sodium salicylate over a long period on the prothrombin content of the blood of the 51 patients. It will be observed that during the first week when the daily dosage was 50 grains (3.2 Gm.) of sodium salicylate there was no change in the prothrombin time from normal levels. In the second week, however, two days after the dosage had been increased to 100 grains (6.6 Gm.) the prothrombin time began to increase. It was not, however, until the patients had been receiving 150 grains (10 Gm.) of sodium salicylate daily for two days that a good percentage of them had an elevation in the prothrombin time. Even with increased salicylate dosage the prothrombin time did not increase beyond the initial increase or remain high in all cases. This phenomenon is difficult to explain but tends to support the original observation

7. Link, K. P.; Overman, R. S.; Sullivan, W. R.; Huebner, C. F., and Scheel, L. D.: Studies on the Hemorrhagic Sweet Clover Disease: XI. Hypoprothrombinemia in the Rat Induced by Salicylic Acid, J. Biol. Chem. **147**: 463-474 (Feb.) 1943.

8. A side observation in our present study is pertinent; namely, that salicylate could not be detected in the blood of a patient who had great prolongation of the Quick prothrombin time following the ingestion of dicumarol.

by Link and his associates [7] that the prothrombin time in rats is affected little by increase in dosage of salicylic acid from 10 to 100 mg. It is difficult to compare our results with previous reports primarily because our studies have been carried out over a much longer period and the dosages employed have been increasingly larger. At no time during this study were any abnormal hemorrhagic manifestations noted in the 51 patients taking salicylates.

In chart 2 are represented graphically the weekly prothrombin determinations on the controls. This group showed no appreciable change in their prothrombin time over the period of four weeks during which they received sodium bicarbonate.

In chart 3 are represented graphically the prothrombin determinations for 9 patients who received 150 grains (10 Gm.) of sodium salicylate daily with or without sodium bicarbonate over a period of three weeks. As previously noted by other investigators, the prothrombin time did not rise until about the second or third day. The salicylate level in the blood of all these patients was between 30 and 50 mg. per hundred cubic centimeters throughout the study. In spite of this high level of salicylates in the blood there was no great progressive increase in the number of patients who had an abnormal prothrombin time. Even on this therapeutic dosage of salicylates the increase of prothrombin time was not pronounced, and at no time in any case was any hemorrhagic manifestation noted.

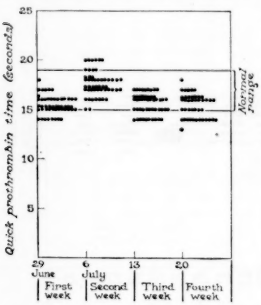

Chart 2.—Effect of progressively higher dosages of sodium bicarbonate on the prothrombin time of the blood of 54 patients who had rheumatic fever and were serving as controls for this study.

Hepatic Parenchyma.—Hanzlik and Wetzel [9] have reported that salicyl is not chemically changed by the liver. They reported that in dogs with hepatic degeneration from phosphorus poisoning the urinary secretion of salicyl was as prompt and as good as in normal control dogs. Smyth and Whipple [10] found no effect from sodium salicylate, in therapeutic doses, on the excretion of bile salts in dogs with permanent biliary fistulas. In the present studies the van den Bergh reaction was indirect for all patients in both groups before, during and after the study. Likewise the serum bilirubin was not increased above normal in any instance nor was the hepatic function altered as measured by the dye retention method. It is realized that there are many more sensitive tests of liver function which might have detected some minor degree of hepatic parenchymal damage in these cases. However, the interpretation of such minor alterations in liver function is indeed difficult. It is our impression from this study that sodium salicylate, even in large doses, has little, if any, deleterious effect on the hepatic parenchyma.

9. Hanzlik, P. J., and Wetzel, N. C.: The Salicylates: XI. The Stability and Destruction of the Salicyl Group Under Biological Conditions, J. Pharmacol. & Exper. Therap. **14**: 25-42 (Sept.) 1919.

10. Smyth, F. S., and Whipple, G. H.: Bile Salt Metabolism: IV. Negative Influence of Drugs, Atropine, Pilocarpine, Phlorhizin, Quinine, etc., J. Biol. Chem. **59**: 655-659 (April) 1924.

Levels of Salicylate in the Blood.—Only for a short period have satisfactory methods been available which could measure the salicylate level in the blood of man. Although the salicylate level was determined three times a week for five weeks on the 51 patients who were taking salicylates, these results are not shown for several reasons. It was noted in this study that even in the third and fourth weeks of medication there were instances in which the salicylate level of the blood was still less than 20 mg. per hundred cubic centimeters. It was difficult to believe that any of these patients with such low levels possessed any abnormality in regard to absorption of the drug. In light of some of our more recent studies on absorption, the only explanation is that these subjects in some manner did not take the salicylates which were ordered for them. In fact, some later admitted that this was the truth. Such an unfortunate circumstance is nearly unpreventable in a large military institution and parallels closely the experience of medical officers attempting to maintain adequate prophylaxis with atabrine in troops in the South Pacific area and of those trying to give prophylactic dosages of sulfadiazine.

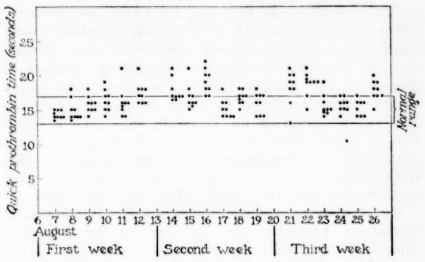

Chart 3.—Effect of the daily administration of 150 grains (10 Gm.) of sodium salicylate with and without sodium bicarbonate on the prothrombin time of 9 patients who had rheumatic fever. The daily level of salicylates in the blood of all these varied between 30 and 50 mg. per hundred cubic centimeters.

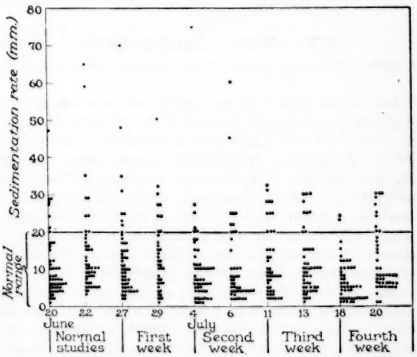

Chart 4.—The normal and triweekly blood sedimentation rates of 51 patients with rheumatic fever who were taking sodium salicylate in increasing amounts.

A large majority of the patients, however, took the drugs as ordered and the blood salicylate level of all

of these when they received 150 grains (10 Gm.) of sodium salicylate a day varied between 30 and 50 mg. per hundred cubic centimeters. After medication was discontinued, the blood salicylate level fell rapidly and was nearly zero at the end of three or four days. From this study it would seem that adequate level of salicylate in the blood is maintained in most persons on an oral dosage of 100 to 150 grains (6.6 to 10 Gm.) of sodium salicylate daily.

Sedimentation Rate.—The effect of administration of salicylates on the sedimentation rate has been a subject of considerable controversy for many years. Some students believe that the administration of salicylates in most instances is followed by a fall in the sedimentation rate. Others feel that the fall in the sedimentation rate is at least speeded by the administration of this drug. Many others, however, are equally convinced that the administration of salicylates has little effect on the alterations, up or down, of the blood sedimentation rate in rheumatic fever. Charts 4 and 5 represent graphically the sedimentation rates for

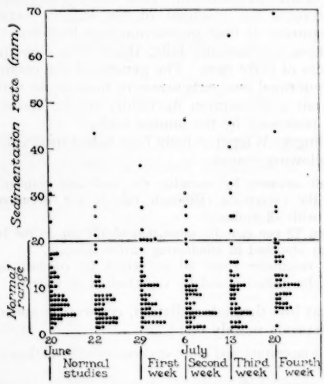

Chart 5.—The normal and weekly blood sedimentation rate of 54 patients with rheumatic fever serving as controls. These patients were receiving sodium bicarbonate in increasing amounts.

both groups of patients studied. It will be observed in chart 4 that in spite of continuous administration of salicylate a few patients, as mentioned before, had recurrence of acute polycyclic rheumatic fever with a subsequent rise in the blood sedimentation rate. Most of these men had an adequate salicylate level in the blood. In spite of the continued high dosage of salicylates, the sedimentation rate remained elevated in a few of these patients throughout the study. The controls, however, had nearly the same number of rises in the blood sedimentation rate as the patients treated with sodium salicylate; in most instances these too represented a recurrence of rheumatic fever.

It has been shown by Coburn [11] and others that the administration of large doses of salicylates in a first acute attack of rheumatic fever is followed by a rather rapid fall in the blood sedimentation rate. The present studies suggest that patients with polycyclic rheumatic fever do not respond clinically, nor does the sedimentation rate respond to the administration of salicylates in a manner comparable to that observed in a first acute attack. At present there is no known explanation for this interesting phenomenon.

Urine.—Hanzlik [12] reported that the administration of sodium salicylate in full therapeutic doses invariably causes the appearance of albumin, leukocytes and granular casts or castlike bodies in the urine of normal, rheumatic, convalescent, febrile and afebrile persons. They observed that quantitatively the albuminuria reached its maximum at the time of symptoms of salicylism and then gradually diminished and eventually disappeared. They further noted that the administration of sodium bicarbonate in amounts equal to the dosage of salicylates had no effect on the albuminuria. Our findings are nearly exactly opposite to those reported by Hanzlik. A few leukocytes were found in specimens of urine from only 6 of the 51 patients who received large doses of sodium salicylate. In each of these 6 cases the leukocytes were found in only one specimen of urine. Similar observations were made on 8 of the controls. In neither group of patients was albuminuria noted on any occasion.

Blood.—In charting the effect of salicylates and sodium bicarbonate on the hemoglobin and erythrocyte count, it is our impression that both the hemoglobin level and the erythrocyte count decreased slightly. This, however, may result from the disease rather than from the drug. The leukocyte count was unaffected in either subjects or controls.

COMMENT

This study confirms previous reports that the administration of sodium salicylate results in some effect on prothrombin content of the blood. This study made with undiluted plasma shows, however, that this effect is not great and that with even large dosage the prothrombin content of the blood is not dangerously reduced and hemorrhage from therapeutic administration of salicylates is certainly unlikely. Many instances have been recorded in the literature [13] in which administration of salicylates in fatal doses has been followed by hemorrhagic changes as noted at necropsy. Purpura, however, occurs in many cases of rheumatic fever in which the prothrombin time is normal and salicylates are not being given. To assume that such objective findings in cases of rheumatic fever are a result of salicylate therapy is misleading. On the other hand, if any surgical procedure is contemplated or arises as an emergency in case of rheumatic fever in which large doses of salicylates are being administered, vitamin K obviously should be given before and after operation.

As with dicumarol, the increase in prothrombin time following administration of salicylates is not noted until twenty-four to thirty-six hours after administration of the drug. There seems to be little correlation between the increase in prothrombin time and the level of salicylates in the blood. In other words, when once the rise in the prothrombin time has taken place, an increased dosage of salicylate seems to have no tendency to cause a further increase in the prothrombin time.

The question arises as to why patients taking salicylates do not all have an increase in the prothrombin time. The work of Link and his associates indicates that the level of vitamin K in the diet has a profound influence on the hypoprothrombinemic action of salicyl-

11. Coburn, A. F.: Salicylate Therapy in Rheumatic Fever: A Rational Technic, Bull. Johns Hopkins Hosp. **73**: 435-464 (Dec.) 1943.

12. Hanzlik, P. J.: Actions and Uses of the Salicylates and Cinchophen in Medicine, Medicine **5**: 197-373 (Aug.) 1926.

13. Wetzel, N. C., and Nourse, J. D.: Wintergreen Poisoning, Arch. Path. **1**: 182-188 (Feb.) 1926.

ates in rats. The difference in the intake of vitamin K might explain why only certain ones of our patients developed hypoprothrombinemia following administration of salicylates. It also would be interesting to know whether prothrombin A or prothrombin B is affected by administration of salicylates.

SUMMARY

From this study the following observations were made:

1. The administration of sodium salicylate with sodium bicarbonate in therapeutic doses to patients with rheumatic fever is followed by an increase in the Quick prothrombin time. In none of the cases reported were any hemorrhagic manifestations noted following the administration of salicylates.

2. Under the circumstances of this study, the administration of salicylates had no deleterious effect on the hepatic parenchyma.

3. A dosage of 150 grains (10 Gm.) of sodium salicylate daily is followed in most instances by a blood level of salicylate of 30 to 50 mg. per hundred cubic centimeters. When the level of salicylates in the blood falls much below these figures, one can suspect that the patient is not taking the drug.

4. In recurrent attacks of polycyclic rheumatic fever the sedimentation rate is little affected by the administration of salicylates.

5. Long continued high dosage of salicylates is followed by a slight reduction in the hemoglobin content and erythrocyte count. The leukocyte count is unaffected by salicylates, as is the urine.

STATISTICAL STUDY OF 265 CASES OF HEAT DISEASE

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When work involving muscular exertion is performed by the human body over a sustained period of time in an atmosphere having a high external temperature and a high humidity, the pathologic effects of heat accumulation are frequently observed. Such a condition represents a potentially serious medical problem and one which may prove rapidly fatal in its later stages. Its proper control and treatment are highly important, especially when a large number of individuals are concerned.

This problem has been recognized and studied by many industrial plants and organizations over some years, and a great deal of progress has already been made in its management.

Modern warfare has focused further attention on heat exhaustion because of its high casualty rate in operations under adverse climatic conditions, especially in tropical and semitropical locations. Both the British and American armies have encountered the problem in training as well as in combat operations. In the Iraq campaign the casualty rate among British troops was higher from heat (8 per cent) than from all other causes (4.1 per cent).[1]

1. Marsh, Frank: Etiology of Heat Stroke and Sun Traumatism, Tr. Roy. Soc. Trop. Med. & Hyg. **24**: 257-288 (Nov.) 1930.

At this post the high incidence of heat exhaustion during the summer months has been a major medical concern. Fort Eustis is located along the southern coastline, situated on a low flat peninsula, bounded on the north and south by rivers. During the months of June, July and August there is a high external temperature with a high humidity and a low wind velocity. Troops, particularly unseasoned troops, undergoing training under such climatic conditions show a high casualty rate from the effects of heat. In the summer of 1942, 4 cases of heat stroke were admitted to the hospital in shock with pulmonary edema and terminated fatally despite heroic treatment. This experience stimulated an intensive investigation of the available data on heat disease, and the present report deals with the results of our investigation and subsequent management of the problem.

PHYSIOLOGIC CONSIDERATIONS

Man, as a warm blooded animal in contrast to a cold blooded animal, possesses certain mechanisms to maintain a constant body temperature despite the temperature of the environment. This stability of temperature represents the resultant of the balance between the mechanisms of heat production and heat loss.[2] If one of these mechanisms fails, there is a consequent gain or loss of body heat. The genesis of the condition commonly termed heat exhaustion or heat stroke usually occurs from a diminution or failure of the means of heat loss possessed by the human body.

According to Wiggers,[3] body heat is lost or dissipated by the following routes:

(*a*) Small amounts by warming the food and respired air and with the excretions (although this is not in universal agreement with all authors).

(*b*) About 15 per cent by saturation of the air in the lungs and by heat absorbed in eliminating carbon dioxide.

(*c*) The remainder (over 80 per cent) by conduction, by convection, by radiation and by vaporization of water.

The heat loss through radiation, convection and conduction depends mainly on:[4]

(*a*) Air temperature and other environmental conditions (i. e. the humidity).

(*b*) The nature and amount of clothing.

(*c*) The quantity of heat produced in the body reflected by the degree of body temperature.

It is well known that the exposed skin surface acts as a black body radiator to the direct rays of the sun and thus will absorb heat rapidly from this source. The infra-red or heat waves may however be deflected by satisfactory clothing.

It is very important to evaluate properly the part played by the vaporization of water as a means of heat loss in the production of pathologic effects from heat accumulation. Below atmospheric temperatures of 28 to 30 C. (82.4 to 86 F.) vaporization of water from the skin plays little part as a means of heat dissipation[5] (about 25 per cent and a third of this is due to loss of water by respiration).[6] While the percentage of heat loss by vaporization of water is nearly constant below this level, as the external temperature rises above it and approaches 35 C. (95 F.) vaporization of water becomes an increasingly impor-

2. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, ed. 3, Baltimore, Williams & Wilkins Company, 1943, p. 1042.
3. Wiggers, C. J.: Physiology in Health and Disease, ed. 3, Philadelphia, Lea & Febiger, 1939, p. 929.
4. Best and Taylor,[2] p. 1048.
5. Best and Taylor,[2] p. 1051.
6. Wiggers,[3] p. 932.

tant means of heat dissipation until at or near 35 C. it is practically the sole means of heat loss.[7] Effective vaporization of water from the skin surface depends chiefly on the ability of the surrounding air to absorb additional moisture (i. e. the degree of relative humidity) and to some extent by movement of the surrounding air.

Another important feature of effective heat dissipation under adverse weather conditions is that the relative humidity of the air has little effect on heat loss by convection; probably the most important factor influencing heat loss by this means is air movement (wind velocity).[5] This is of some importance in properly correlating the wind velocity with other meteorologic data in relation to possible or probable incidence of heat disease over any given period.

From the foregoing discussion it would seem that the relative humidity would be the most important meteorologic reading in considering atmospheric conditions likely to produce heat effects. This is not totally true. The relative humidity per se does not seem to be the critical factor. On two days, June 8 (fig. 1) and July 8 (fig. 2) the relative humidity was high (86 and 85), but also comparatively low dry bulb and wet bulb temperatures were existent with a low wind velocity. No heat cases occurred. Conversely, on June 2 and 3 (fig. 1) the relative humidity was low (43 and 41 respectively) but the dry and wet bulb temperatures were high, with a wind velocity of approximately 10 miles per hour. The incidence of heat cases was high, especially on June 2.

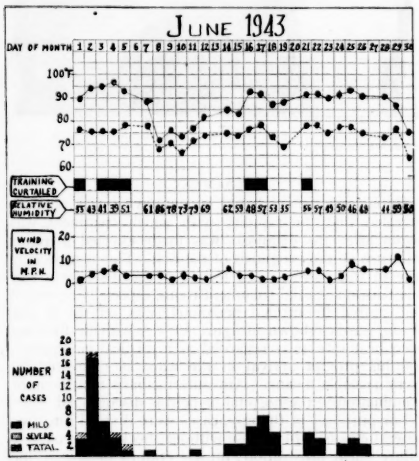

Fig. 1.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number of and severity of cases each day during June 1943. In figures 1, 2 and 3 the upper (solid line) temperature curve is dry bulb and the lower (broken line) is wet bulb.

On the other hand, the wet bulb temperature seems to be a good indicator of the probable incidence of heat disease. The possible explanation for this is that the wet bulb temperature is the resultant of two factors: the external temperature and the degree of saturation of the air with water vapor (humidity). At temperatures of 28 to 30 C. (82.4 to 86 F.) and below, the mechanisms of convection, radiation and conduction play a large part in total heat loss, sufficient to compensate for little loss by vaporization of water. At temperatures of over 30 C. (86 F.) vaporization of water plays an increasingly predominant role, but even a comparatively low relative humidity of the atmosphere is not a sufficient compensation to prevent heat accumulation with high wet and dry bulb readings, if the wind velocity is low.

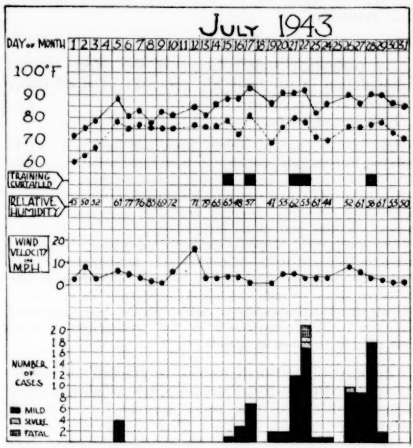

Fig. 2.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number and severity of cases each day during July 1943.

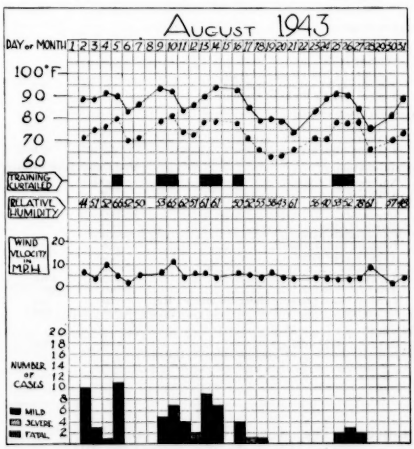

Fig. 3.—Highest daily dry temperature with corresponding wet bulb temperature, relative humidity, wind velocity and number and severity of cases each day during August 1943.

7. Wiggers,[8] p. 933, figure 205.

Figures 1, 2 and 3 show clearly the effect of physical exertion on the incidence of heat disorder. No heat cases were seen on any Sunday during the three month period illustrated, a day on which physical training, activity and exposure to direct rays of the sun were at a minimum.

INCIDENCE AND SYMPTOMATOLOGY

The pathologic manifestations of the effects of heat accumulation in the body are generally grouped under the general term of heat disease.

This is divided into:

Heat cramps (muscle cramps from salt loss).[8] (This is, however, not entirely specific for heat cases alone, as it may occur in any environment as a result of salt and fluid loss.)

Heat prostration,[9] characterized by weakness, usually some temperature elevation, anorexia, headache, abdominal distress, nausea, vomiting and visual disturbances.

Heat exhaustion, when evidence of circulatory failure is present in addition to the effects of heat accumulation. High temperature may or may not be present, depending on the degree of shock present.

Heat stroke, representing a failure of the heat regulatory mechanisms with hyperpyrexia as the predominant feature; coma may or may not be present.[9]

The onset of heat distress may be gradual and insidious and elicit only casual attention, but an abrupt rapid change into one of the more serious forms is not uncommon.

The accompanying table shows the statistical data on the incidence, symptomatology and effects of physical training on heat disease based on our observation of 265 cases from May 1 through September 1943.

Statistical Study of 265 Cases of Heat Disease

May–September 1943

Geographic Location of Cases:		
Home states		
Southern		15.8%
Northern		81.5
Stay in hospital:		
3 days or less		88.0%
Training activity:		
Patients in first 4 weeks of training		39.0%
Patients in 5-8 weeks of training		38.0
Patients past 8 weeks of training		23.0
Age limit (18-39 years):		
Patients 18-21 years of age		53.0%
Patients 22-30 years of age		25.0
Patients over 30 years of age		22.0
Symptomatology:	**Mild Cases**	**Severe Cases**
Nausea	18.0%	13.0%
Vomiting	5.0	13.0
Vertigo	74.0	88.0
Headache	19.0	53.0
Muscle cramps	14.0	13.0
Carpopedal spasm	8.0	0.0
Dyspnea (subjective)	48.0	100.0
Anxiety-apprehension	31.0	37.0
Cyanosis	5.0	50.0
Tachycardia	40.0	100.0
Fever (over 99.6 F.)	78.0	100.0
Systolic blood pressure under 100 mm. of Hg	4.0	75.0
Comatose	0.0	84.0
Treatment:		
Oxygen (100%) inhalation	48.0	100.0
Isotonic solution of sodium chloride (intravenous)	27.0	25.0
Plasma	12.0	88.0
Sedation (mild)	28.0	75.0

The striking difference shown in the incidence of heat disease between men of the Northern and Southern sections of the country is probably more apparent than real, because comparative figures for the entire population of the post showing the number of men from various geographic localities were not compiled.

For the five month period of May through September 1943 there was a total of 265 cases of heat disease seen at the station hospital: 23 in May, 70 in June, 92 in July, 72 in August and 7 in September.

Fig. 4.—Equipment for the treatment of heat disease. Fan under lattice bed is not shown.

TREATMENT

Initial experiences based on our own series of cases revealed that the rapidity with which treatment was begun after the diagnosis was made exerted a major influence on the prognosis of the case. This is especially true in the more severe forms of the disorder. For this reason a special treatment room, especially equipped and staffed by trained personnel, was set up in one of our wards (shown in figure 4). A patient suffering from heat disease is regarded as a medical emergency, and his prompt arrival in the ward is expedited by every possible means. Any intermediary treatment or examination in the hospital or field is discouraged.

For purposes of therapy, cases were divided into two general classes: (1) those without shock or circulatory failure (heat prostration; muscle cramps or spasm due to salt depletion); (2) those with circulatory failure or shock present or impending (heat exhaustion; heat stroke). The latter two classes of heat disease were regarded as severe forms of the same pathologic process but of different degree; the former predominated by the picture of circulatory collapse, while the latter appears largely as a severe metabolic change characterized chiefly by hyperthermia. The circulatory changes observed in heat exhaustion have been compared to those noted in mild adrenal cortical insufficiency.[10]

In the milder cases of group 1 generally complaining only of weakness, headache, nausea and malaise, sedation is promptly given (bromides, phenobarbital or sodium amytal by rectum or hypodermically to avoid nausea); an ice cap is placed on the head; a tap water sponge bath is given; increased ventilation over the exposed surface of the body is secured with electric fans; an increased intake of fluids and salt in the form of salinized water (0.1 per cent) cooled to 50 degrees is forced orally. If nausea and vomiting were present,

8. Talbott, J. H.: Water and Salt Requirements in Health and Disease, J. A. M. A. **119:** 1418 (Aug. 22) 1942.
9. Wiggers,[5] p. 941.
10. Duncan, Garfield, G.: Diseases of Metabolism, ed. 1, Philadelphia, W. B. Saunders Company, 1935, p. 268.

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1,000 cc. of 0.9 per cent sterile saline solution was given slowly by the intravenous route or by hypodermoclysis, depending on the individual indications of the particular case. The intravenous administration of 0.9 per cent saline solution seemed specific for relief of muscle (heat) cramps.

The temperature, pulse, respiration and blood pressure were checked at hourly or half-hourly intervals, depending on the exigencies of the case, until a stable, normal level was reached.

If the rectal temperature is over 102 F. the skin surface of the trunk and extremities is sprayed at five minute intervals with a fine mist tap water spray delivered from any suitable spray equipment, and increased evaporation of this is effected by directed air currents from electric fans. When the rectal temperature reaches 102 F. or is initially below this reading, the fan-spray is not advised, as too rapid cooling of the body may be subsequently produced. While the spray is in use, the temperature is checked every fifteen minutes.

In the treatment of the more severe cases in the second group (heat exhaustion, heat stroke) in which shock may be present, the rapid restoration of the circulating fluid volume is perhaps the chief objective to be accomplished. In heat stroke rapid cooling of the body is the main objective of therapy. In addition to the general principles of therapy already discussed additional procedures are used:

1. Five hundred cc. of plasma by vein is given immediately and repeated in thirty to forty-five minutes if the blood pressure response has not been satisfactory. The use of intravenous salt solution for this purpose has not seemed advisable to us owing to its ready diffusibility into the tissues through dilated and possibly damaged capillary walls. In addition, it is felt that this characteristic might aid in precipitating a pulmonary edema. Depletion of plasma and tissue chlorides[10] from excess sweating and fluid loss may be restored on recovery from shock.

2. One hundred per cent oxygen is administered by mask to combat the reduced oxygen carrying capacity of the hemoglobin, which is stated by Wiggers[11] to be reduced in this condition and the tissue oxygen deficit due to circulatory deficiency.

3. The extremities are massaged to stimulate circulation through these parts.[12]

4. Circulatory stimulants such as ephedrine, caffeine, amphetamine or metrazol are used as additional aids in restoring an adequate circulation, if needed.

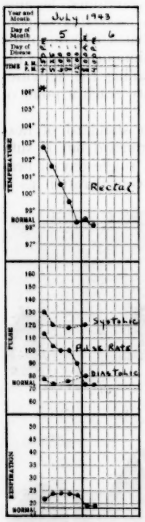

Figure 5

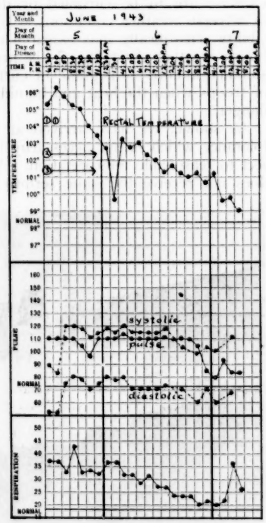

Figure 6

Fig. 5 (F. B., white man).—Clinical course of a mild case of heat disease following treatment. Treatment (*) 1,000 cc. of isotonic solution of sodium chloride intravenously and tepid sponge.

Fig. 6 (L. A., white man).—Clinical course of a severe case of heat disease following treatment. Treatment: (1) 500 cc. of blood plasma, (2) body surface kept wet with fine tap water spray, (3) 100 per cent oxygen by B. L. B. mask.

Figure 5 shows the response to treatment in a mild case (group 1, no plasma or oxygen therapy given); intravenous saline solution was given on admission. Figure 6 reveals the response in a more severe case to treatment (group 2, plasma and oxygen given). The prompt response of the blood pressure to plasma can be seen.

During the five month period of 1943 three fatalities occurred, a mortality rate of 1.1 per cent. Although no figures for comparison of therapeutic results by different methods of treatment are available to us, this routine has seemed a satisfactory method of approach on the basis of our results.

PATHOLOGIC FINDINGS

A detailed description of the pathologic findings will not be given in this paper, as these are to be the subject of a separate report from the Pathology Department. The final pathologic diagnoses based on postmortem examinations in 3 fatal cases in 1943, however, will suffice to show the common findings and their similarity:

(*a*) Subendocardial hemorrhages of the interventricular septum near the base of the aortic and pulmonic vessels and adjacent areas of the papillary muscle, with involvement of the conduction system. (All 3 cases showed these findings.)

(*b*) Petechial hemorrhages involving scattered areas of (1) the cerebrum, (2) the duodenal mucosa, first and second portions, (3) subserous areas of the large intestine, (4) the peritoneal serosa, (5) the lungs, (6) the kidneys.

(*c*) Hemorrhages and edema of the brain involving the midbrain, hypothalamus, pons, hippocampus, meninges and periventricular region of the thalamus (1 case).

(*d*) Intra-alveolar hemorrhage of the lungs, bilateral, acute (1 case).

(*e*) Passive congestion of the liver, spleen, kidneys and lungs (3 cases).

All three fatalities occurred in men who had undergone strenuous physical exertion under adverse climatic conditions with high wet and dry bulb temperatures. One of these men was found to have died in his barracks during the night, following a day of strenuous physical activity.

Clinically, in several nonfatal cases with pronounced hyperthermia, scattered subcutaneous petechial hemorrhages over the surface of the trunk and extremities were noted. Differentiation of the more severe forms of heat disease, especially those with petechial lesions and other forms of acute pathologic change such as meningococcic infection, bacterial endocarditis, typhus

11. Wiggers,[3] p. 944.
12. Circular Letter No. 136, S. G. O., War Department, A. S. F., Washington, D. C., July 28, 1943.

and typhoid, may at times be difficult. Blood culture, agglutination tests, examination of the skin lesions [13] plus a careful physical examination and history will at times be necessary in order to arrive at a correct diagnosis. Trauma likewise in obscure cases will have to be ruled out.

HOUR	8:20	9:20	10:20	11:20	12:20	1:20	2:20	3:20	4:20	6:00
JULY 21-1943								No. Patients		12
Dry Bulb	80	81	83.5	85	87	89	89.5	91	90.5	91
Wet Bulb	76	76	77.5	77	78.5	80	79	80	78	78
Humidity	83	80	76	70	68	67.5	63	62	57	56
Wind Velocity	3	3	3	2	3	3	2	5	4	2
JULY 22-1943								No. Patients		20
Dry Bulb	80	83	84	87.5	90.5	91	93	92	92	91
Wet Bulb	76	77	77	79.5	78.5	79	79	79	78	78
Humidity	83	76	73	70	58	58	53.5	56	53	56
Wind Velocity	3	5	5	3	4	3	3	4	2	2
JULY 23-1943								No. Patients		1
Dry Bulb	73	74	77	78	79	80	82	81.5	81	81
Wet Bulb	68	68	68.5	69	69.5	70	72	70.5	71	70.5
Humidity	78	74	65	67	62	61	61	68	61	61
Wind Velocity	5	10	7	4	5	5	3	7	2	4
JULY 24-1943								No. Patients		1
Dry Bulb	74	76.5	79	78	82	83	84.5	86	84	82
Wet Bulb	69.5	70	70	70	71	70	70	70	70	70
Humidity	80	72	64	67	58	51.5	49	44	49	55
Wind Velocity	2	1	2	1	6	1	5	3	3	2

■ Suspension of Close Order Drill and Strenuous Training

Fig. 7.—Daily and hourly meteorologic chart maintained as a guide to the administrative control of excessive exercise.

PROPHYLACTIC CONTROL

Daily meteorologic data during the "hot season" of the year when atmospheric temperatures are high on both the wet and dry bulb thermometers are an important feature in exercising preventive control over a serious incidence of heat cases.

Our figures for critical wet bulb temperatures agree with those given in a recent British article [1] on heat effects in a tropical climate. Their findings were:

(*a*) Physical activity should be on a reduced scale at a wet bulb temperature of 75 to 76 degrees.

(*b*) At 79 degrees wet bulb all physical activity (such as long marches, drills and calisthenics) was halted for unseasoned troops.

(*c*) Seasoned troops who had been acclimated could carry on limited physical activity up to a wet bulb reading of 80 to 81 degrees.

Based on the British standards, our figures for curtailment or limitation of strenuous physical training were arbitrarily adopted. The correlation of the wind velocity with these figures was put in on an experimental basis. The limits thus in use at this post for the summer of 1943 were as follows:

(*a*) If the wind velocity is 10 miles per hour or over, the wet bulb temperature may go to 77 degrees before limiting physical activity if the dry bulb temperature does not exceed 88 F.

(*b*) With a wind velocity below 5 miles per hour (decreased means of heat loss by convection), if the wet bulb temperature reaches 75 to 76 degrees a dry bulb temperature of 88 F. is considered maximum for continuation of full physical activity.

13. Tompkins, V. N.: The Diagnostic Value of Smears from Purpuric Lesions of the Skin in Meningococcic Disease, J. A. M. A. **123**: 31 (Sept. 4) 1943.

(*c*) A wet bulb temperature of 78 to 79 degrees with a wind velocity below 10 miles per hour is considered to be the danger point for any physical activity if the dry bulb temperature is 88 F. or above.

Other important measures of preventive control are:

The intake of salt and fluid should be adequate. The use of 0.1 per cent salinized water for drinking purposes has been found by us to be the most practical means of securing this on a consistent basis. It has seemed to be superior to the distribution of salt tablets for consumption. It is palatable and well borne. The equivalent of 2 tumblers (500 cc.) is advised for consumption every sixty to ninety minutes by unseasoned troops during an exercise period on hot humid days.

The clothing should be light and well ventilated. The same type of protective head cover should be worn in direct sunlight.

The diet should be light and low in protein, especially the midday meal. It seems preferable to give the main meal in the evening after the strenuous work of the day is over.

ADMINISTRATIVE PROBLEMS

The medical administration of a military reservation located in a hot humid climate and used for conditioning trainees is a responsibility that must be recognized and met. To the post surgeon falls the duty of advising the commanding officer of the post when drills and exercise are to be curtailed or discontinued because of adverse weather conditions. To meet this responsibility scientifically it is essential that a diagrammatic hourly weather chart (fig. 7) be maintained during the summer months as a guide in curtailing the activities of troops when the heat and humidity reach a point of danger.

As shown, we have arrived at a standard of heat tolerance which is not necessarily ironclad but is subject to reasonable interpretation. A single day of heat does not receive the same serious consideration as a

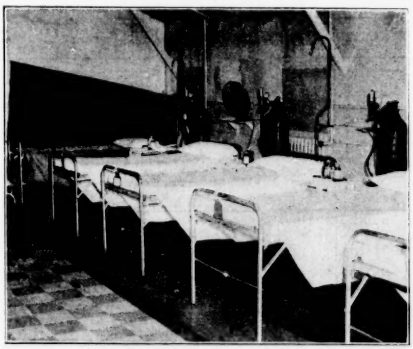

Fig. 8.—Air conditioned ward set up for immediate use. Bed in corner of room is the same equipment as that shown in figure 4. Remaining beds are set up for treatment of mild cases.

number of days of continuous high temperature. The longer the heat wave without respite, the more exacting the orders to curtail activity.

It was found that the most careful check-up system had to be employed to enforce the intake of salinized water as a preventive measure. All patients with heat exhaustion entering the hospital without a history of

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taking the prescribed sodium chloride have been reported to headquarters for appropriate disciplinary action against the supervising officer for this oversight. This has brought results.

Instructor officers, trained in the Southwest section of our country (Texas), where the temperature is high, the atmosphere dry and the nights cold, have used woolen shirts to good advantage for the protection of their men on hikes and drills. The blast effect of stoking a furnace when the door is suddenly opened is not unlike the conditions met in heat with a dry atmosphere, where wool will ward off the rays of the sun that would otherwise penetrate cotton. This principle does not apply to high temperature with high humidity, where aeration is essential to the evaporization of moisture. This difference must at times be clarified.

Recently there have been stationed at this post British colonial troops wearing shorts with elbow length sleeve shirts. This uniform is military in appearance and the envy of our troops who are clothed in the conventional regulation long trousers and long sleeved shirts.

About eighteen months ago station hospitals were authorized one air conditioned postoperative recovery ward. Because of the urgent need at this hospital for the treatment of many cases of heat disease, this authorization was diverted to our heat project (fig. 8).

Pressure by military training centers not to curtail or cancel the activities of their prearranged program for reasons of excessive heat is not uncommon, since military instructors are limited in the time allotted to them for training. Night maneuvers constitute one way to regain lost time given up during the hot, humid daylight hours. As a safety factor, the control of this situation must be met by the post surgeon with diplomatic but unrelenting firmness.

SUMMARY

1. In a climate with a high atmospheric temperature, high humidity and a low wind velocity the incidence of pathologic effects from heat on the human body tend to be high.

2. The initial effects of heat accumulation in human beings may be mild and of insidious onset, eliciting only casual attention in its early stages. Such a condition, however, may abruptly and rapidly change into one of the more severe stages of the disorder accompanied by a high fatality rate.

3. Heat loss in man is chiefly accomplished by radiation, convection, conduction and vaporization of water.

4. As the external temperature rises above 30 C. (86 F.) vaporization of water becomes the increasingly predominant means of heat loss in the human body, until at or near 35 C. (95 F.) it is practically the sole means of heat dissipation.

5. While vaporization of water from the skin surface depends mainly on the degree of saturation of the air with moisture (relative humidity), the wet bulb temperature seems a more sensitive indicator of the probable incidence of heat disease at high atmospheric temperatures than the relative humidity per se.

6. Strenuous physical activity under adverse climatic conditions strongly increases the incidence of heat effects, especially when performed by persons not acclimatized.

7. In the treatment of the more severe cases in which circulatory failure or shock was present or impending, the intravenous administration of 1 to 2 units of plasma is recommended over the use of saline solution, owing to the ready diffusibility of the latter into the tissues. This characteristic of the latter solution presents certain disadvantages on this basis in a state of shock.

8. The use of 100 per cent oxygen by mask has proved advantageous in the treatment of shock in combating both a reduced oxygen carrying capacity of the hemoglobin and the tissue oxygen deficit.

EMERGENCIES IN THE ALLERGIST'S PRACTICE

GEORGE L. WALDBOTT, M.D.
DETROIT

Any one who treats a large number of allergic patients has had his share of emergencies. The very fact that he is dealing with hypersensitive individuals makes him more liable to accidents than other doctors. These experiences make him pause to reflect on and ponder over them, searching both for their causes and for ways of avoiding future occurrences. In the present article my own solution to this problem will be discussed, if, indeed, such a solution is possible. The subject will be presented under three headings: (A) accidents arising from skin tests, (B) accidents arising from treatment with allergenic extracts and (C) other emergencies in allergic patients.

DIAGNOSIS

Since parts 1 and 2 are concerned solely with the allergic reaction, I shall dwell briefly on its diagnosis and differential diagnosis. Regardless of whether such a reaction results from an injection of pollen extract, of animal serum, of an organic or nonorganic chemical or from inhalation or ingestion of some substance to which the patient is very sensitive, the symptomatology is very characteristic and well known. It is a combination of allergic respiratory symptoms with hives.[1] There is a tendency for the manifestation to concentrate in a preexisting shock organ; i. e., a patient with an eczema will develop considerable aggravation of the eczematous lesion, one with gastrointestinal symptoms may develop severe intestinal cramps, one with asthma may only show an attack of asthma without much accompanying urticaria, one with allergic symptoms in the uterus, uterine cramps. If the reaction is brought about by an intravenous injection, no symptoms other than collapse may be noticeable. In an individual whose allergy has been recently acquired, severe shock may overshadow all other symptoms, skin edema being completely absent. It seems as though these patients are not as yet able to react to the influx of the antigen into the system with the hives and with the usual asthmatic attack.

DIFFERENTIAL DIAGNOSIS

Confusion may arise by not clearly distinguishing these reactions from nonallergic ones which may result from any type of hypodermic medication. The following conditions should be considered in differential diagnosis:

1. *Syncope.*—The ordinary fainting spell is the most frequent source of diagnostic difficulties, especially if convulsions accompany the fainting. The low pulse rate and the relatively prompt recovery after the patient assumes a prone position permit one to make the proper diagnosis.

1. Waldbott, G. L.: Systemic Reactions from Pollen Injections, J. A. M. A. **98**: 1848 (May 30) 1931; The Prevention of Anaphylactic Shock,

2. *Febrile Reactions.*—These appear within an hour or two after an injection. They are brought on by contamination of the injected material with bacterial and other protein elements or by certain chemicals originating from rubber ware used in preparing the solutions.

3. *Focal Reactions.*—Focal reactions from hypodermic injection of any kind represent the activation of a dormant focus of infection.[2] On several occasions I have seen the flare-up of a chronic appendicitis, a furuncle, a tooth abscess or a sinus infection from an injection of pollen extract.[3]

4. *Reactions from Pulmonary Thrombosis.*—These are very rare. If the patient develops, immediately after an injection, a severe pain in the chest, cough and expectoration, followed by a low grade bronchopneumonia, this possibility should be kept in mind.

5. *Toxic Reactions.*—These result from the action of an injected drug. Thus the vasodilating effect of an intravenous injection of aminophylline or the characteristic response to epinephrine may be confused by the inexperienced with an allergic reaction.

A. REACTIONS FROM SKIN TESTS

During intradermal skin testing, reactions are brought about by an extreme degree of sensitivity to the tested material. Among the fatal cases reported in the literature, some may have been induced by the accidental introduction of the testing material into a small vein. Since such reactions are encountered but rarely in dermal tests, some clinicians believe that they can safeguard themselves against such accidents by taking the precaution of doing preliminary dermal tests before the intradermals are done. Generalized reactions however occur in spite of negative scratch tests.[4] The most obvious reason for this is the fact that scratch testing material loses its potency relatively soon.

The following precautions may be taken to prevent accidents from intradermal testing:

Rule 1. In children below 6 years of age, skin tests should never be done by the intradermal method. The most severe reactions are, in my experience, encountered in this age group. A great deal of trouble has been avoided in my own work since the introduction of this rule. Passive transfer tests in young children are not only most reliable to the physician but are also appreciated by parents and by children alike.

Rule 2. If, in the course of history taking, a patient mentions that the ingestion or inhalation of a particular antigenic material has given rise to asthma, hives or allergic shock, a C for caution is entered on the record. Automatically these materials are excluded from intradermal testing. In other words, if a patient develops an attack of asthma or of hives on being near a horse or on eating peanuts, it can be taken for granted that he is sensitive to the horsehair or the peanuts. If a quantitative study of this sensitivity is indicated, however, such extreme dilutions (i. e. 1:1,000,000) are used for testing as to exclude the possibility of any harm. Every twenty minutes a stronger dilution is administered, intradermally, until a fairly strong wheal is obtained.

Rule 3. An attempt is made to gain a general impression of the patient's state of sensitivity by the response to the tests which are done first. Pollens are well suited to serve as a guide for such an estimate because they are the most common reactors in allergic patients, and from the history a clue can be obtained as to the strength of concentration for the intradermal tests. If the reactions to pollens are very strong, all subsequent testing is done with a diluted set (1:10) instead of with the regular testing materials. Since tests for nuts, fish and beans have brought on more frequent reactions than other antigens, they are done last. Fish and nuts are frequently omitted altogether if the wheals from the other tests are unusually extensive.

Rule 4. This concerns the technic of testing. Arms and legs are preferable to the back for the tests because a tourniquet can be applied if necessary. Superficial veins should be carefully avoided. When the wheals are seen to spread out shortly after the injections, a tourniquet and epinephrine should be kept in readiness. After the tests have been given the patient should be carefully watched, particularly within the first few minutes. Incidentally, the layout of an allergist's office should be arranged in such a manner that all the patients are in constant view of the physician or his personnel. The closing of a door after skin testing should be carefully avoided. The treatment of the allergic reaction will be discussed later.

B. REACTIONS FROM TREATMENTS

For therapeutic purposes it is necessary to differentiate clearly between a reaction from the accidental puncture of a vein and one resulting from an overdose. Such a distinction determines not only the immediate treatment but also the course of subsequent injections. A further classification is indicated, depending on whether the extract is injected directly into the blood stream or next to a punctured vein, whence it gradually seeps into the blood stream. In other words, there are three clinically distinct types of reactions, each one requiring different treatment, namely the "overdose reaction," the "intravenous reaction" and the "backseepage reaction." The incidence of these reactions was recorded in a series of 18,775 injections of pollen extract as follows:[5] backseepage reactions, 1:1,564; intravenous reactions, 1:9,387; overdose reactions, 1:308.

Intravenous and Backseepage Reactions.—The intravenous reaction is characterized by the complete absence of a local swelling at the site of injection, by its onset within ten to twenty seconds after the injection and by its unusual gravity. Internal symptoms prevail, especially those attributable to edema of the lungs and of the liver, namely, collapse and extreme bronchospasm. The full climax occurs immediately, and, with the exception of generalized weakness or a low grade pulmonary infection, little if any after effect is noticeable when it has been brought under complete control.

In contrast with this the backseepage reaction requires between one and several minutes until the first symptoms appear. A local edema, which soon becomes intense, arises at the site of injection and spreads quickly over the body surface. There may be some blood at the site of the injection or, more often, a bloody suffusion under the skin which is rapidly replaced by a wheal. The symptoms are both cutaneous and internal. They are severe, and as a rule collapse is present.

In treating the intravenous and the backseepage reaction, speed is most essential in the immediate admin-

2. Hench, P. S.: Usual and Unusual Reactions to Protein (Fever) Therapy, Arch. Int. Med. **49**: 1 (Jan.) 1932.
3. Waldbott, G. L.: Allergic Shock from Substances Other Than Pollen and Serum, Ann. Int. Med. **7**: 1308, 1934.
4. Waldbott, G. L.: The Prevention of Anaphylactic Shock, J. A. M. A. **98**: 446 (Feb. 6) 1932.
5. Waldbott, G. L., and Ascher, M. S.: The Role of Accidental Puncture of Veins in the Production of Allergic Shock, Ann. Int. Med. **9**: 1232, 1936.

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istration of large doses (1 to 2 cc.) of epinephrine. The lapse of even a minute will alter the outcome considerably. This is followed up by aminophylline (3½ to 7 grains, or 0.2 to 0.5 Gm.), administered intravenously. The needle should be kept in the vein and, if there is no tendency to recovery within a short time, epinephrine in doses of 0.1 to 0.3 cc. may be given intravenously. This is done very cautiously by attaching to the needle a 10 cc. syringe containing some epinephrine. Blood is withdrawn and carefully mixed with the drug, and a part of this mixture is injected very slowly. If epinephrine is injected into the blood stream in full strength without this precaution, even small amounts may lead to serious brain or cardiac injuries. It is difficult to say whether or not, in these extreme emergencies, concentrated solution of glucose, administered intravenously, and oxygen, may be of assistance.

For the prevention of a reaction from venipuncture, the following precautions are suggested: 1. An effort should be made to select an area for the antigenic injection between visible veins. 2. Before injecting the extract, the plunger should be repeatedly withdrawn for evidence of blood. 3. Immediately after the injection, the site should be inspected for escaping blood. 4. Cotton should be applied with pressure on the area from which blood escapes in order to prevent backseepage. It is readily appreciated that not one of these measures is, in itself, a definite safeguard. Watching the site for superficial veins before injecting does not preclude hitting a blood vessel in the lower layers. Absence of blood in the syringe on withdrawing the plunger does not indicate that a vessel has not been punctured. One must always be aware that a single drop of extract reaching the blood stream might induce relatively severe symptoms. Furthermore, the escape of blood from the site of the injection does not necessarily indicate that a vein has been punctured. The bleeding may be capillary or arterial in origin and, therefore, harmless. Nevertheless, one should remain on guard, prepared to administer epinephrine when blood is seen. Some have advocated combining small doses of epinephrine with the antigenic extract for prophylactic purposes.[6] I consider this practical only if the treatment is given by a nurse in the doctor's absence or when dealing with exceptionally sensitive patients. Incidentally, the self administration of extracts by patients is dangerous, since, on puncturing a vein, the patient would be unable to administer the necessary further treatment.

Overdose Reactions.—The reaction from an overdose is always initiated by a local edema at the site of the treatment. This has a tendency to spread and to become more or less itchy. It can often be seen expanding along the lymph channels before generalized urticaria and respiratory symptoms occur. No matter how large the overdose may have been, there is always a lapse of time of between a few minutes up to an hour before generalized symptoms arise. The shorter this time interval, the more severe the reaction is likely to be. After the initial control by epinephrine there is a tendency to recurring urticaria. This is in contrast with the immediate onset and the immediate climax in an intravenous reaction.

The overdose may be due to error in judgment concerning the patient's state of sensitivity. It may also be brought about by switching from an old extract to a fresh and more potent one. Occasionally the simultaneous absorption of other antigens to which the patient is sensitive accounts for the effect of an overdose. If a patient has inhaled or eaten an antigen to which he is sensitive shortly before his treatment, an otherwise adequate dose may result in an overdose reaction. Such an accumulative effect from inhaled and injected antigens is encountered when, on days of high pollen or fungus concentration in the air, reactions occur like an epidemic if the doses are not properly reduced.

For the prevention of overdose reactions the following points should be stressed: careful labeling of the various concentrations of extracts; clearly displaying the labels of the bottles in the racks; employing syringes of different color for the low and the highly concentrated extracts; thorough cleansing of the syringes before they are sterilized; careful gaging of the patient's state of sensitivity by initial tests; adequate reduction of the doses with fresh extracts, particularly after a previous overdose reaction has occurred.

As to treatment, the overdose reaction, unlike the intravenous one, does not require more than 0.1 to 0.2 cc. of epinephrine unless it is unusually severe. These small doses may have to be repeated if the symptoms do not subside. Larger amounts of epinephrine produce more discomfort to the patient than the reaction itself. The application of a tourniquet above the site of injection is of considerable value,[7] which is not true in an intravenous reaction. Aminophylline may be given intravenously if indicated for asthmatic wheezing. Careful inspection of the patient's arm within ten to fifteen minutes after the injection will serve as a warning of an impending reaction. The patient should not be permitted to leave the office until the injected area has been inspected.

C. OTHER EMERGENCIES

Fortunately emergencies other than those occurring during antigenic treatment and skin testing are not frequently encountered. Shock from ingestion of food to which the patient is very sensitive, or from inhalation of certain air borne antigens, exhibits the same manifestations as the allergic reaction from an injection and has to be dealt with accordingly. In shock from ingestion, plain water enemas and the induction of vomiting are helpful. In shock from inhalation, local applications of epinephrine to the nose and a nose spray with epinephrine 1:100 may be of assistance. The system tends to rid itself of the antigen by vomiting, diarrhea or a profuse flow of fluid from the nose, lungs and sinuses, which process should be encouraged by treatment.

An asthmatic attack may be so severe that it cannot be clearly distinguished clinically from allergic shock. The most frequent cause of such extreme attacks is the ingestion of an aspirin tablet. It would lead too far afield to present detailed treatment for this condition here. Of the many therapeutic measures recommended, the only reliable means for instantaneous relief are aminophylline and epinephrine; the value of glucose, oxygen, helium and other substances is debatable. If an extreme seizure of asthma fails to respond, a bronchoscope should be introduced into the lungs for aspiration and lavage of accumulated mucus. As a life-saving procedure, this is as startling in its results as tracheotomy in diphtheria.

Few have had an opportunity to witness edema of the glottis. This may occur in the course of urticaria, in allergic shock and in serum sickness. I have recently

6. Duke, W. W.: New Method of Administering Pollen Extract for Purposes of Preventing Reactions, J. A. M. A. **94**: 767 (March 15) 1930.

7. Insley, S. W.: The Control of Immediate Shock Following Hypodermic Medication, J. A. M. A. **94**: 765 (March 15) 1930.

seen a child who had recurrent laryngeal stridor and evidence of glottis edema, which responded promptly to small doses of epinephrine. The patient's father had died from the same condition. Skin tests done by the passive transfer method were negative. It could not be ascertained whether or not the patient's situation was psychogenic in origin. As the only prophylaxis which one might offer, these patients should be advised to carry with them epinephrine both for inhalation and for injection. Tracheotomy might be indicated if other measures have failed.

Another rare type of accident, to which little reference is made in the literature on allergy, is seen during extreme cyanosis in the course of an asthmatic attack. The patient usually jumps forward and falls on the floor, being completely unconscious for a period of from twenty to fifty seconds. He recuperates promptly and spontaneously. I have seen this in 3 patients in my office, and others have described this condition to me. It is evidently due to anoxemia of the brain, which adjusts itself spontaneously. The fainting brings about a general relaxation of the patient, which might effect a widening of the bronchi and thus the air passes more freely into the lungs.

Emergencies have been reported from the use of drugs in allergic patients, even from such valuable ones as epinephrine and aminophylline. An individual with serious cardiac damage, who had been in the habit of administering to himself 1 cc. of epinephrine several times daily, died instantaneously on taking such a dose. Blood was found escaping from the area of injection, indicating that he might have punctured a vein. In another case an injection of epinephrine had to be made intravenously because all other attempts at reviving the patient from allergic shock had failed. Severe cerebral disturbances such as aphasia, athetotic movements and paralysis of the facial musculature developed, similar to those described recently by Applebaum.[8] This condition lasted for two days but cleared up spontaneously, and it was interpreted as the effect of the drug on the cerebral vessels. Such experiences suggest the following precautions: discouragement of self administration of epinephrine among patients; avoidance of intravenous injections; whenever possible administration of small doses only.

Intravenous injections of aminophylline have been the source of fatal reactions.[9] It is true that the peculiar sensation in the face and the mouth which is typical of its action has caused patients to faint, but in my experience, with at least 20,000 injections,[10] I have never seen any serious ill effect from it. The injection is always made very slowly. Only one third to one half of the 3¾ grain (0.24 Gm.) ampule is used, which is sufficient to procure therapeutic results. If the patient's systolic blood pressure is below 90, 0.1 cc. of epinephrine is given subcutaneously shortly before the aminophylline is injected. Incidentally, sensitivity to either aminophylline or epinephrine has never been demonstrated.

In the allergic patient emergencies may arise from any other drug. Sensitivity to acetylsalicylic acid unquestionably accounts for the most serious ones. Morphine and other opiates follow next in importance. Agents to be injected for the purpose of sclerosing varicose veins may give rise to severe allergic reactions. The development of such sensitivity to a certain drug seems to depend largely on the amount of time which has elapsed since its previous administration. If this interval is between ten days and four weeks, the patient is most likely to become sensitized. Regular daily or weekly doses appear to be less harmful. Highly concentrated glucose or salt solutions can be safely employed for sclerosing veins if one wishes to eliminate the possibility of allergic shock. In considering the proper dose of drugs, it has been suggested to us by experiments on dogs [11] that the tolerance to a certain drug is lower in an allergic individual than in a normal one.

The allergist is often consulted by the surgeon, obstetrician and dentist concerning the "best" anesthetic to use for the allergic individual. An answer to this question must necessarily be highly speculative. In 1933 I [12] reported on sensitivity to ether and pontocaine during operation. Autopsies on 2 cases of death from pantocain hydrochloride illustrated that in such emergencies a distinction should be made between sensitization to pontocaine and intoxication from the drug, each condition requiring different therapeutic measures. It is very difficult to determine whether or not a person is sensitive to a certain anesthetic, because there is no sure means of testing for it. From the point of view of sensitivity nitrous oxide anesthesia is perhaps the most harmless one. To a patient sensitive to a certain local anesthetic a spinal anesthetic may be disastrous. In 2 patients subjected to bronchoscopy under intravenous anesthesia, severe spasm of the epiglottis occurred, presumably from the anesthetic employed. The surgeon's skill in prying the larynx open with the bronchoscope prevented asphyxiation.

The following recommendations can be made to the surgeon for an operation on an allergic individual: To have epinephrine and aminophylline on hand for immediate administration, perhaps to give small doses of these drugs prophylactically, shortly before the operation; to attempt avoidance of puncturing small veins when injecting a local anesthetic by repeated withdrawal of the plunger; to refrain from the use of opiates, if at all possible, which tend to depress the respiratory center; to avoid acetylsalicylic acid scrupulously in postoperative care. In such minor surgical procedures as bronchoscopy a barbiturate given by mouth is sufficient to bring about relaxation of the patient. If a patient has to have two operations within a short time, the critical time interval during which sensitization develops should be heeded and a different type of anesthesia employed for the second operation.

SUMMARY

1. Emergencies in the allergist's practice arise mostly from intradermal skin testing and from treatment with antigenic extracts.

2. The principal precautionary measures for the avoidance of reactions from skin testing are omission of tests for antigens to which there is a history of pronounced sensitivity and for others which are known to be common sources of generalized reactions (fish, nuts!); avoidance of intradermal tests in children below 6 years of age.

3. With therapeutic injections of antigenic extracts, caution should be exercised to avoid accidental punc-

8. Applebaum, I. L.: Cerebrovascular Accidents Following Epinephrine Injections, J. Allergy **15**: 392, 1944.

9. Merrill, G. A.: Aminophylline Death, J. A. M. A. **123**: 1115 (Dec. 25) 1943.

10. This is a conservative estimate, since every patient seen by me during an asthmatic seizure is given this drug intravenously.

11. Waldbott, G. L.; Blair, N. B., and McKeever, R.: Tolerance to Sodium Salicylates in Sensitized Animals, to be published.

12. Waldbott, G. L.: So-Called Thymic Death: Respiratory Sensitization to General and Local Anesthetics, Arch. Otolaryng. **17**: 549 (April) 1933.

ture of small veins ("intravenous" and "back-seepage reaction") which is by far more dangerous than the "overdose reaction." Each type requires different measures of prevention and treatment.

4. Other emergencies arise from inhalation and ingestion of antigenic materials to which the patient is very sensitive, from ingestion of drugs, from such common hypodermic medications as epinephrine, and from local and general anesthetics.

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DERMATITIS FROM WEARING APPAREL

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Dermatitis from most types of wearing apparel has been reported usually as isolated instances. On occasions, however, large outbreaks have occurred among the general population because of the sale of new materials containing substances of unknown toxicologic properties which were placed on the market before testing for action on the human skin.

Among articles of wearing apparel, dermatitis has been reported from fabrics such as silk, wool and synthetic fibers, from leather, artificial leather, furs, rubber and rubber containing materials such as rubber gloves, dress shields and girdles, socks, pajamas, brassieres, and many others. Metal and metal alloys used in jewelry and in eyeglass frames, wrist watches and straps have also caused dermatitis. Plastics used in spectacle frames, wrist watch straps, garters and suspenders have also been reported as causes of dermatitis.

FABRICS

While occasional cases of dermatitis have been reported as due to sensitivity to some of the unprocessed fabrics such as silk and wool, the majority of the reported cases of dermatitis due to the wearing of fabrics have been caused by the processed fabrics.

Fabrics as worn by the public consist of the basic fabric itself and all the chemicals which have been placed on them or in them, such as dyes and finishes, in order to make them salable or suitable for wearing purposes.

Sensitivity to Unprocessed Fabrics.—Sensitivity to silk has been reported.[1] Most of the reported cases have been from processed silk. Very few authors differentiate between sensitivity to the raw silk and the chemical with which it was treated. The type of eruption described by most of the writers is of the urticarial type. Urbach [2] described an actual case of contact dermatitis from unprocessed silk.

Fabrics made from wool,[3] camel's hair [4] and other animal hairs have been reported as causes of allergic contact dermatitis. There are no cases of dermatitis reported from unprocessed fabric made from vegetable fibers such as cotton and linen, although dermatitis has been reported as occurring among pickers of flax and also from cottonseed oil (oil of gossypii).

A review of the literature of sensitivity to so-called basic fabrics shows that in most instances the sensitivity tests on which the diagnoses were made were performed not with the actual raw materials but with undyed or unfinished fabrics, so-called gray goods, which are already partially processed. Perhaps another fallacy in some of the reported tests has been failure to distinguish between the physical irritation caused by "wooly" or rough fabric and an actual allergic reaction. As a corollary, a dermatitis may be caused by the friction of a rough material where a patch test for the purpose of demonstrating sensitivity would be negative. In such cases the cause may be the mechanical friction resulting from actual wear.

Synthetic Fibers.—Fabrics for wear are made of processed cellulose (rayon), of a number of synthetic resins, glass and casein.

Cellulose.—From cellulose is manufactured the various rayons such as viscose rayon and acetate rayon.[5] While many cases of dermatitis have been reported among the wearers of these rayons, all the cases were from the finished product and not from the unprocessed material.

Synthetic Resins.—The best known of the purely synthetic resin fabrics are polymers made from hexamethylenediamine and adipic acid and sold under the trade name of Nylon. Although some cases of dermatitis from nylon have been reported, it was shown that these cases were all caused by a certain finish and not the nylon itself.[6] Fabrics are now being made on a small scale from vinyl and styrene resins as well as from fiber made from casein. No cases of dermatitis have been reported from them.

Glass.—Glass is now being spun into fiber. In order to make these fibers suitable for weaving into fabric, certain resins are used on them. Cases of dermatitis have been reported from such glass fabrics. These

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Urbach and Gottlieb.[2]

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4. Camel's hair: Rowe, A. H., and Rogers, H.: Allergic Dermatitis: Report of Case Due to Mohair, California & West. Med. **23**: 1589, 1925.

5. Rayon: Barthelmy, H. L.: Ten Years' Experience with Industrial Hygiene in Connection with the Manufacture of Viscose Rayon, J. Indust. Hyg. & Toxicol. **21**: 141, 1939.

6. Fabric finishes:
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Schwartz, Spolyar, Gastineau, Dalton, Loveman, Sulzberger, Cope and Baer.[10]

cases are due to the resins or the mechanical irritation of the rather sharp fibers and not to allergy to the glass.

Glass wool is made for insulating purposes. Dermatitis occurs in its manufacture and in its use, caused by the mechanical irritation of tiny sharp glass slugs and occasionally from sensitivity to the resin binder (phenol-formaldehyde) which it contains.[7]

Synthetic Films.—Some of the plastics in sheet form are used for protective clothing. Some of them are also laminated onto cotton or other natural fabrics in order to make them impervious. Rubber hydrochloride, vinyl resins, acrylic acid resins and cellulose acetate are used for these purposes. Dermatitis has been reported from the vinyl, the acrylic acid and the rubber hydrochloride films, but in all these cases it was due either to plasticisers or stabilizers used in the films.[8]

The following plasticisers, stabilizers and modifiers have been causes of dermatitis: tricresylphosphate, triphenylphosphate, dibutyl sebacetate, dibutyl tin delaurate, dibutyl tin laurate maleate, phenyl salicylate and resorcin-formaldehyde combination.

Rubber.—Dermatitis from wearing apparel made of rubber has been reported. Gloves, girdles, dress shields, gas masks, condoms and so on have all been reported to cause dermatitis. In all of these cases it was the compound placed in the rubber, such as the accelerator and antioxidants, or compounds formed on the surface of the rubber by "vapor cure" (sulfur monochloride) which have been the actual irritants, not the rubber itself.[9] The following accelerators, antitoxidants and so on have been the cause of dermatitis: hexamethylenetetramine, the guanadines, mercapto benzothiazole, tetramethyl thiuram monosulfide and disulfide, paratoluidine, orthotoluidine, triethyl trimethyl triamine and the antioxidants phenyl beta naphthylamine and monobenzyl ether of hydroquinone (leukoderma).

The accelerators named are contained in many rubber articles which do not cause dermatitis. They cause dermatitis only when they are contained in the rubber in such quantities that they "bloom" out or if they are so loosely incorporated that they can be leached out by the perspiration. The same statement applies to the antioxidants except monobenzyl ether of hydroquinone. This chemical can cause leukoderma even when it is properly incorporated into the rubber.[10]

Dermatitis from "vapor cured" rubber is caused by the fact that continuous changes take place on the surface of vapor cured rubber, and these changes result in the formation of sensitizing chemicals. Those who develop dermatitis from wearing vapor cured gloves (surgeons) may prevent dermatitis in the following manner: soaking the gloves in a 5 per cent solution of sodium carbonate for fifteen minutes and then rinsing in water; sterilizing by dry heat and wearing them dry and well powdered on the inside of the gloves every time the gloves are to be worn. The same procedure should be adopted by those sensitive to rubber gloves made directly from latex, because in such gloves the accelerators and antioxidants are more easily leached out by the perspiration.

Synthetic Rubber.—There are several types of synthetic rubber. The first one made in America was Neoprene, which is made from acetylene. There are now being manufactured Buna S made from butadiene and styrene, Buna N made from butadiene and acrilonitrile, and butyl rubber made from butylene and isoprene. Although these synthetic rubbers have been on the market for a comparatively short time the little wearing apparel, mostly gloves, has been made from them, some cases of dermatitis have been reported.

These synthetic rubbers are processed in the manner similar to that used for processing natural rubber and contain accelerators and antioxidants and other compounds, cured by heat as well as by sulfur monochloride. Most of the cases of dermatitis from synthetic rubbers are probably caused by the same compounds as cause dermatitis in natural rubber, although synthetic rubber does contain sensitizing substances not present in the natural rubbers.[11]

Dyes and Mordants.—Dermatitis due to fabric dyes is relatively infrequent among the wearers of the fabrics.[12] For some time it was the common impression among physicians that dermatitis due to wearing apparel was caused by the dyes in the fabrics.

When dermatitis is caused by the dyes, it is usually due to an idiosyncrasy to the dye itself or to a faulty process of dyeing, so that there is retained in the fabric some chemical which should not have been present. On occasion, dyes will cause dermatitis if one of the known sensitizing dyes are used.

When dyes themselves have been found to be the cause of the dermatitis it has been usually found that they easily come out of the fabric or "bleed." Condi-

7. Glass wool:
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10. Oliver, E. A.; Schwartz, L., and Warren, L. H.: Occupational Leukoderma, J. A. M. A. **113:** 927 (Sept. 2) 1939. Peck, S. M., and Sobotka, H.: Effect of Monobenzyl Hydroquinone on Oxidase Systems in Vivo and Vitro, J. Invest. Dermat. **4:** 325, 1941.

11. Schwartz, L.: Skin Hazards in the Manufacture and Processing of Synthetic Rubber, J. A. M. A. **127:** 389 (Feb. 17) 1945.

12. Dyes:
Ingram, J. T.: Dermatitis in Relation to Idiosyncrasy, Brit. J. Dermat. **44:** 422, 1932.
Ingram, J. T.: Dermatitis from Dyed Hair, Furs and Fabrics, Lancet **2:** 239, 1935.
Kadisch, E. L.: Contact Dermatitis Caused by Dyes in Wearing Apparel, New Jersey State J. Med. **43:** 1051, 1943.
Schwartz, L.: The Actual Causes of Dermatitis Attributed to Socks, Pub. Health Rep. **49:** 1176, 1934.
Schwartz, L., and Hocker, C. D.: Dermatitis Due to Heat Decomposition of Dyes, ibid. **51:** 493, 1936.
Schwartz, L.: Dermatitis from Wrist-Watch Straps, ibid. **51:** 423, 1936.
Tobias, N.: Dermatitis from Wearing Apparel, New Internat. Clin. **3:** 136, 1938.
Kellick, E. M., and Ingram, John T.: Dermatitis Following the Wearing of Dyed Fabrics, Dyer **69:** 248, 1933.
Cox, H. E.: Chemicals in Fabrics as Potential Skin Irritants, Brit. J. Dermat. **54:** 22, 1942.
Schwartz, E.: Contact Dermatitis from Exposure to Dyes, J. Allergy **13:** 417, 1942.
Epstein, Ervin: Eruptions and Photosensitivity Due to Dyed Fabrics, Arch. Dermat. & Syph. **41:** 1044 (June) 1940.

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tions on the skin surface may help to determine the "bleeding" of the dyes from the fabric. For instance, some will bleed out in acid perspiration and others in alkaline. Since some of the dyes are soluble in fat solvents, a high fat content on the skin surface may help dissolve them out. It is also to be borne in mind that the dye intermediates are more likely to cause dermatitis than the finished dyes themselves and that under certain conditions, such as the heat of ironing, some dyes will break down into their intermediates.

Faulty dyeing process may cause dermatitis by leaving in the fabric some chemical irritant which should have been removed, as for instance in vat dyeing or in mordant dyeing the excess of the oxidizing or mordanting bichromate should be removed before the dyeing is finished; otherwise dermatitis may occur on those handling or wearing the fabric. Wool is often dyed by the aid of a mordant. Mordants are also used in certain dyeing processes other than wool dyeing. Of the mordants it is the dichromates which have caused dermatitis. The following dyes have been reported as causing dermatitis: amino-azo-benzine, auramine, brilliant indigo 4G, crystal violet, chrysoidine, hydron blue, iso-rosinduline, indanthrene violet R. R., ionamine A, metanil yellow, methyl violet, malachite green, orange R, orange Y, ponsol dark blue B R, sulfanthrene pink F. F., safranine, victoria blue, victoria green and resorcinol component dyes.

Special dyes are used for dyeing of rayon because the ordinary dyes do not easily penetrate the comparatively solid rayon fabric. Dermatitis has occurred from these special acetate dyes.

Fabric Finishes.—It has been shown that in most instances the dermatitis among the wearers of fabrics was caused by the finishes rather than by the dyes.[6]

Finishes are placed in fabrics to give them a better appearance such as luster, better feel and wearing properties, to prevent runs and unraveling, to make fabrics noncreasing and sometimes to hold the crease and to make them waterproof, mothproof, flameproof, moldproof and insectproof. Some of the finishes stay more or less permanently in the fabric. Other finishes are easily removed by the laundering and only a small part may remain after many washings. For this reason finishes which are removed by laundering are reapplied after each laundering.

Starches and sulfonated castor oil were the first finishes used and were applied to enhance the appearance and the feel of the fabric and thus increase its selling appeal. Dermatitis has never been reported from starch, but Schwartz showed that an improperly neutralized sulfonated castor oil (alkalinity) was the cause of a dermatitis from socks.

Antiwrinkle and Crease Holding Finishes.—More recently certain resins have been applied as finishes to make the fabric resistant to wrinkling or to hold its crease and, in the case of stockings, to prevent runs. These resins are usually applied in the dye bath and consist of modified natural or totally synthetic resins. Schwartz and his associates [13] showed that an outbreak of dermatitis thought at first to be due to a synthetic fabric was really due to a finish containing an ester gum. This finish was used on other fabrics and caused dermatitis.

The new synthetic resin finishes have caused a number of cases of dermatitis. The resins are applied from solutions or emulsions which leave a thin film of the resin on the fabric after evaporation of the solvents. The resins, ester gums, the formaldehyde type, methyl methacrylate, vinyl, styrene and glyptal resins may be applied in this manner. Some of the resins when applied in the form of emulsions containing uncured or partially cured resins are completely cured in the heat of the finishing bath and in the heat of the boarding process.

Completely cured resins do not as a rule cause dermatitis. When complete polymerization and stabilization does not occur, there may be enough free monomers or uncured resins remaining on the fabric to cause dermatitis in sensitive cases. Actual sensitization by the fabric can occur also.

Glycerin-phthalic anhydride resins are used in emulsions containing alkali such as ammonia or sodium hydroxide or triethanolamine. These resins may also contain impurities which are skin irritants.

The dicyandiamide-formaldehyde resins may undergo decomposition to form methylamines which may cause dermatitis. Other resins which cause sensitization dermatitis may be introduced into use as fabric finishes.

Waterproof Finishes.—In some of the older methods of waterproofing fabrics (1) the fabric was placed in the soap bath followed by alum or other aluminum salts in watery solution in order to deposit aluminum soap on the fabric or (2) an application of aluminum or lead soap from an organic solvent such as benzene was made. There are no recorded cases of dermatitis from the finished materials proved to be due to waterproofing agents containing these insoluble metallic soaps.

In still another method of waterproofing, the fabric after dyeing and drying is then passed through a solution of paraffin dissolved in a petroleum solvent and again dried over hot cylinders. When Japan wax was used instead of paraffin, dermatitis was seen from such coated fabrics because Japan and China wax are derived from a tree of the poison ivy family (Rhus vernicefera).

Fabrics have been treated with tar or resins and rubberized in order to make them waterproof. Dermatitis has been seen from such materials only among the processors of the fabrics.

Flameproofing.—Canvas and leather gloves, sleeves and aprons are used as a protective by welders to protect them against sparks. These materials may be treated with flameproofing chemicals. Asbestos also is used. Wearers of asbestos do not have dermatitis from it, as it is not worn next to the skin.

Cotton and silk are often flameproofed by treating with chlorinated naphthalenes, ammonium sulfamate, boric acid and borate, diammonium phosphate, antimony chloride or other substances. Although workers making clothing from these materials sometimes develop dermatitis and workers processing fabrics with chlorinated naphthalenes may develop chloracne, cases of dermatitis among the users of these fabrics have not been reported.

Delustering Agents.—Zinc sulfate, barium sulfate, aluminum sulfate and titanium oxides are some of the chemicals used as delustering agents. No dermatitis has been reported from their use.

Mothproofing and Lousicides.—Silico fluorides are most frequently used for mothproofing, although the chlornaphthalenes (naphtha balls), chlorbenzene, chlorphenols, synthetic camphor and others also are used. The solutions of silico fluorides are usually sprayed on the fabrics. The chlornaphthalenes and camphor used in the form of flakes or balls are placed in the clothes

13. Schwartz, L.; Spolyar, L. W.; Gastineau, F. M.; Dalton, J. E.; Loveman, M. B.; Sulzberger, M. B.; Cope, E. P., and Baer, R. L.: An Outbreak of Dermatitis from New Resin Fabric Finishes, J. A. M. A. **115**: 906 (Sept. 14) 1940.

or closets. Dermatitis has not been reported from fabrics exposed to these substances.

Since the outbreak of World War II, it has been found desirable for sanitary reasons and as a protective measure against typhus to treat clothing of our armed forces with chemicals known to kill lice and other related insects. The most widely used and effective agent at present is DDT (dichlor-diphenyl trichlorethane). It can be used alone or in combination with other insecticides. Other insecticides such as pyrethrum, rotenone (the active principle of derris and cube) and synthetic insecticides may be used.

The synthetic insecticides are usually primary irritants in strong concentrations, and the natural insecticides are sensitizers.

Antimildews.—With the advent of the war it has been found necessary to mildew-proof many articles of clothing and equipment made of fabric and leather to prevent their deterioration in tropical climates. Tenting, hammocks, camouflage and mosquito netting, knapsacks, canvas covers of all types, interlinings of shoes and many other articles have been treated with mildewproofing agents. They are so precipitated on the fabrics that they will be retained after many washings. While many chemicals are excellent fungicides, they cannot be incorporated into articles of clothing or equipment which are to be in close contact with the skin because they are primary skin irritants and sensitizers [14] in the concentrations in which they satisfy antimildew performance specifications against molds. Even if such irritant chemicals are incorporated into materials which are not to be in contact with the skin, such as sandbags and tenting, they have been the causes of dermatitis to the workers making those materials. This does not imply that such chemicals should not be used in fabrics which will not be worn next to the skin.

We have tested many of the compounds which have been suggested by our armed forces as mildewproofing agents by means of the "prophetic patch test." [15] Actual field trials have supported the value of this procedure,

TABLE 1.—*Mildewproofing Agents*

	Percentage of Weight of Material
Phenyl mercury acetate	0.1
Pentachlorphenol	1.0
Tetrachlorphenol	1.0
2 chlor 6 phenyl phenol	1.0
Dihydroxy dichloro diphenyl methane	0.45
Alkyl phenoxy ethoxy dimethyl benzyl ammonium chloride	1.0
Trichlorphenate	2.0
Copper naphthenate	1.0
Copper palmitoleate	1.0
Aminoguiacol benzothiazole aminourea	1.8
Salicylanilide	0.5
Phenyl mercury lactide	0.45
Phenyl mercury lactate	0.4
Tetra brom orthocresol	0.45
Para nitrophenol	0.5
Phemerol (formula)	4.0
Phenyl mercuric phenolate	0.25
Mercapto benzothiazole	0.45

when properly carried out, to rule out the use of those chemicals which would cause dermatitis.

The mildewproofing agents listed in table 1 in the incorporated concentrations given have been found to be skin irritants.

When some of the antimildews named in the table were used on fabrics which were also waterproofed by superimposing a wax, the patch tests were negative because the antimildew did not come in contact with the skin. However, under some conditions of manufacture the workers would have sufficient contact to cause dermatitis when the superimposed waterproofing

TABLE 2.—*Substances Remaining in the Leather*

Dyes
Bismarck brown
Amido-azo-benzene
Amido-azo-toluene hydrochloride
Chrysoidine
Tanning agents
Chromates
Oak
Sumac
Quercitron
Finishes
Fish oil
Castor oil
Resins

material was rubbed off after continual friction with the workers' skin, thus exposing them to the action of the antimildew.

Leather.—Dermatitis among leather workers is not infrequent because of the many primary irritants and sensitizers used in processing the hides to convert them into leather. However, the incidence of dermatitis due to wearing and handling leather goods is small compared to the millions of users. Dermatitis has been reported from hatbands, gloves, wrist-watch straps, pocketbooks, furs and other leather articles.[16]

Many of the chemicals used in processing hides to convert them into leather may be the cause of the dermatitis, but the tanning agents and the dyes have been found to be the most frequent causes of the dermatitis among the wearers and handlers of the finished leather goods. Recently another source of dermatitis among those exposed to the finished leathers has been introduced by the addition of mildewproofing agents to the leather. We have encountered a number of instances of dermatitis due to these chemicals, but as yet leather containing the mildewproofing agents has not been used for a sufficient time by the general public for reports of such cases to have appeared.

The majority of the cases of dermatitis due to contact with leather have been of the allergic type. The sensitizing chemicals may have been dissolved out of the leather by water or perspiration.

The sensitivity may have been acquired by contact with the chemicals in the leather, or the sensitivity may have resulted from previous contact with similar chemicals used in other articles of wearing apparel. The substances remaining in the leather listed in table 2 may be causes of dermatitis.

Antimildews and Fungicides.—We have found leather in which the following chemicals were used as antimildews capable of producing dermatitis: mercapto benzothiozol, tetrabrom ortho cresol, paranitrophenol, pentachlorphenol, salicyl analid and dihydroxy dichlor diphenyl methane.

14. Antimildews:
Davies, J. H. T., and Barker, A. N.: Textile Dermatitis, Brit. J. Dermat. & Syph. **56**: 33, 1944.

15. Schwartz, L., and Peck, S. M.: The Patch Test in Contact Dermatitis, Pub. Health Rep. **59**: 546, 1944. Sulzberger, M. B., and Wise, F.: The Contact or Patch Test in Dermatology, Arch. Dermat. & Syph. **23**: 519 (March) 1931.

16. Leather:
Chargin, Louis: Hatband Dermatitis, Arch. Dermat. & Syph. **26**: 1128 (Dec.) 1932.
Downing, J. G.: Cutaneous Eruptions Among Industrial Workers, ibid. **39**: 12 (Jan.) 1939.
Norwood, W. D., and Evans, E. E.: Industrial Dermatitis from Gloves, J. A. M. A. **114**: 1523 (April 20) 1940.
White, P.: Dermatergoses, New York, Paul B. Hoeber, 1928.

Lollar [17] performed patch tests with seven antimildews contained in leather in concentrations of 0.75 per cent and less and obtained reactions from para-chlorometa-cresol, phenyl mercuri-acetate, ethyl mercuri phosphate and puratized N-5-X (organic mercurial).

Artificial Leather.—Materials designated as artificial leather may be made from cotton fabrics covered by cellulose nitrate and vegetable oils, synthetic resins or rubber solution, or latex may be impregnated into cotton or loosely felted papers or napped soft felted fabrics. In some instances the cotton fabrics are covered with plastics. Sheets of artificial leather may be made from loose fibers and scrap leather which are compressed after mixing with linseed oil. The grains of the different leather are then put on the surface by embossing machines or engraved press plates. Concentrated uncoagulated pastes of compounded latex and fibers are dried, pressed and vulcanized in another process of making artificial leather.

Dermatitis may occur from such artificial leather from the dyes, the resins, the formaldehyde, sulfur, the antitoxidants and other chemicals used in its manufacture.[18]

Shoes.—Dermatitis from shoes has been frequently reported in the literature.[19] A number of instances of dermatitis from the shoe polish have also been observed. Such instances have been more frequently reported in the European literature probably because Americans are not in the habit of polishing their own shoes as much as the Europeans. It is hard to conceive of a dermatitis from the outer leather of the shoes, since there is very little contact with the skin of the foot. The chemicals incorporated in the outer leather would have to go through the backing and through the socks in order to produce a dermatitis.

The inner lining of the shoes as well as the backing contains chemicals which may cause dermatitis. The backing of the shoes contains adhesives, antimildews and fungicides. In a number of instances artificial leather may be used on the inside of the shoe.

Furs.—There are many reported instances of dermatitis due to the handling and wearing of furs.[20] While a dermatitis among the wearers of furs may occur from the mechanical friction of the coarse hairs against the skin or to a sensitivity to the unprocessed fur, such occurrences are rare. In the majority of such cases it is due to the dyes and the tanning agents.

Since the nonhairy hide of the pelt is covered by lining, only the fur itself comes in contact with the skin. Thus the chemicals used for tanning and dressing the fur rarely cause dermatitis, especially since they are present in only traces in the hair of the fur.

It is the dyes and the mordants used with them which are applied to the hairs that cause the dermatitis from wearing of furs. It is necessary for the wearer to be sensitized to these chemicals before the garment is worn or to have been sensitized by wearing the garment in order to develop dermatitis. Furthermore, in order to cause a sensitivity the furs must be so poorly dyed that they are leached out by perspiration or moisture. It is possible that, once sensitivity has developed, even a well dyed fur may cause dermatitis.

Paraphenylenediamine has been the chief cause of dermatitis from fur. The other oxidizing dyes, aniline black and ortho amino phenol, may also cause it. The chrome mordants are also possible etiologic factors.

Paraphenylenediamine is a white crystalline substance which itself is comparatively nonirritant. In using it for a fur it must be oxidized. The first oxidation product is said to be quinone diamine, which is an unstable compound capable of producing local irritation of the mucous membranes. This chemical is said to be the actual cause of dermatitis from paraphenylenediamine. Further oxidation results in the formation of a chemical known as Bandrowski's base, which is not yet the final black oxidation product but is not supposed to be irritant.

The reduction of the incidence of dermatitis among the users of furs is in the hands of the dyers. In recent years they have been aware of this fact and have processed the furs with greater care so that now we rarely see reports of cases. The preventive measures used by the dyers include the use of weak solutions of the dyes frequently applied or applied for longer periods rather than concentrated solutions for short periods, the careful oxidation of the dye and the thorough removal of excess or unoxidized dyes by washing and drumming.

Jewelry.—Dermatitis produced by jewelry has been reported.[21] In most instances it was due to metallic jewelry, but dermatitis can occur from some of the modern jewelry made from various plastics and other materials. Cases of dermatitis from earrings, necklaces, lockets, watches and spectacle frames have been reported.

Most of the reported cases of dermatitis from metallic jewelry have been attributed to the nickel. Such cases of nickel sensitivity have been found among the wearers of watches and spectacle frames made of nickel alloys, among which is the so-called white gold.

17. Lollar, R. M.: Report on a Study and the Development of a Mold Resistant Treatment for Leather, J. Am. Leather Chemists A. **39:** 12, 1944.

18. Artificial leather:
Bennett, H.: The Chemical Formulary **2:** 284, **6:** 271, Brooklyn, Chemical Publishing Company, 1943.
Schwartz, L., and Tulipan, L.: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 322.
White, S. J.: Dermatitis from Imitation Leather, Arch. Dermat. & Syph. **45:** 1164 (June) 1942.

19. Shoes:
Anderson, N. P., and Ayres, Samuel, Jr.: Dermatitis Venenata Due to Shoe Leather, J. A. M. A. **89:** 25 (July 2) 1932.
Blair, J. A.: Shoe Leather Dermatitis, Brit. M. J. **1:** 171, 1932.
Bloch, Bruno: The Role of Idiosyncrasy and Allergy in Dermatology, Arch. Dermat. & Syph. **19:** 175 (Jan.) 1929.
Burgess, J. F.: Contact Dermatitis of the Feet, Canad. M. A. J. **47:** 2299, 1942.
Lewis, S. M.: Dermatitis Venenata Due to Shoe Leather, Arch. Dermat. & Syph. **24:** 597 (Oct.) 1931.
Lord, L. W., and Wolfe, W. D.: Dermatitis Due to Shoe Leather and to Shoe Polish, ibid. **38:** 434 (Sept.) 1938.
Niles, H. D.: Dermatitis Due to Shoe Leather, J. A. M. A. **110:** 363 (Jan. 29) 1938.
Parkhurst, Howard J.: Dermatitis Venenata Due to Deerskin Gloves, ibid. **99:** 301 (July 23) 1932.
Shaw, Clarence: Dermatitis Due to Shoes, Arch. Dermat. & Syph. **49:** 191 (March) 1944.

20. Furs:
Cox, H. E.: The Chemical Examination of Furs in Relation to Dermatitis, Analyst **54:** 694, 1929; **58:** 738, 1933; **59:** 3, 1934.
Ingram, J. J.: Dermatitis from Dyed Hairs, Furs and Fabrics, Lancet **2:** 239, 1935.
Kesten, Beatrice, and Lazlo, Elizabeth: Dermatitis Venenata, Arch. Dermat. & Syph. **23:** 221 (Feb.) 1931.
Paterson, W. S. C.: Unusual Paraphenylenediamine Dermatitis, Brit. J. Dermat. **47:** 468, 1930.
Percival, G. H.: Experimental Observations on Dermatitis Due to Dyed Fur, Lancet **2:** 417, 1931.
Schwartz, L., and Tulipan, L.: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 281.

21. Jewelry:
Bonnevie: The Interpretation of Patch Tests in Nickel Eczema Reports, 9 Kongress d. Nordesch. Dermat. Vereins, Copenhagen, April 10, 1935.
Burckhardt, W.: Contributions to Question of Eczema: III. The Role of Injury from Alkali on the Skin in Experimental Sensitivity to Nickel, Arch. f. Dermat. u. Syph. **173:** 262, 1935.
Cormia, E., and Stewart, G.: Nickel Dermatitis: Report of 11 Cases, Canad. M. A. J. **32:** 270, 1935.
Foster, P. D., and Ball, F. L.: Sources of Nickel Eczema, Arch. Dermat. & Syph. **31:** 461 (April) 1935.
Higoumenakis, G. C.: Contribution to the Study of Dermatitis Due to Jewelry, Rev. franç. de dermat. et vénéréol. **11:** 211, 1935.
Jarnecke, Hans: Alteration of the Color of the Hair by External Influences, Dermat. Wchnschr. **100:** 212, 1938.
Rabeau, H., and Ukrainczyk: On the Intolerance to the Nickel-Cobalt Group, Bull. Soc. franç. de dermat. et syph. **45:** 1872, 1938.
Frank, H.: Occupational Eczema in Watch Makers, Schweiz. med. Wchnschr. **1:** 232, 1936.
Schwartz, L., and Tulipan, L.: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 635.

Schwartz and Tulipan report sensitization to platinic oxide in a worker handling this material, but we have been unable to find any instances of dermatitis in the literature from the wearing of platinum jewelry.

Andrews shows a photograph with the legend "dermatitis from chromium wrist watch." No particulars as to the exact cause of the dermatitis are given.

Feathers.—Contact dermatitis from feathers in wearing apparel is a rarity, since most of the wearing apparel made from feathers is used as ornaments on hats or other objects and there is but little contact with the skin. In the past, contact dermatitis due to feathers has been reported mainly among children who had contact with the feathers in pillows and bedding.[22]

DIAGNOSIS

Dermatitis from wearing apparel is not difficult to diagnose. The eruption begins at the place of contact with the offending material, usually five days or more after the garment has been worn. This is the period of incubation for the sensitivity to be established. The eruption may appear sooner if the person is already sensitive to the chemical in the wearing apparel which causes the dermatitis. The eruption is usually confined to the areas of the skin touched by the offending material. In exceptional cases, however, a generalized eruption may be present and sometimes systemic symptoms such as elevation of temperature may accompany the dermatitis.

It is recommended that the following facts be ascertained in order to make an etiologic diagnosis:

1. When did patient buy the wearing apparel?
2. From what firm?
3. Date when wearing apparel was first worn.
4. Date when eruption began.
5. What parts of body were first affected?
6. Extent of eruption.
7. Description of eruption.
8. What previous skin diseases?
9. Has the patient any history of allergy of the skin or the mucous membranes?
10. Were any drugs taken before the present eruption?
11. Did the patient come in contact with poison ivy or other irritant plant before the present eruption?
12. Is the eruption still present?
13. How long after the patient stopped wearing the apparel did the eruption persist?
14. Were patch tests performed? Give details and results.
15. Has the actual chemical in the wearing apparel causing the dermatitis been discovered?
16. What method was employed for determining the actual chemical causing the dermatitis?
17. Give the basic facts on which the diagnosis of dermatitis from wearing apparel was made.
18. What treatment was given?
19. Prognosis.

PATCH TEST

The patch test, properly carried out and interpreted, is the most practical method for demonstrating the actual cause of a contact dermatitis.[23] It has been recently used by manufacturers to determine the possible skin irritating or sensitizing properties of wearing apparel containing new chemicals before placing them on sale to the public.[15]

Technic of the Patch Test.—Before an attempt is made to describe the methods used for patch testing, clear distinction must be made between substances which are primary skin irritants and those which will be called sensitizers. It is obvious that a concentrated solution of a strong acid or alkali will burn or inflame any skin, the degree of injury depending on the concentration of the irritant, the amount applied, the duration of its action and the area to which it is applied.

A group of dermatologists acting as consultants to the Public Health Service have defined a primary skin irritant as follows:[24]

A primary cutaneous irritant is an agent which will cause dermatitis by direct action on the normal skin at the site of contact if it is permitted to act in sufficient intensity or quantity for a sufficient length of time.

Many chemicals which are primary irritants are also sensitizers, for instance, formaldehyde, alkaline bichromates, mercuric salts and phenols.

It is obvious that patch testing with strong concentrations of known primary irritants will result in reactions on any skin. This does not mean that patch tests should not be performed with dilute solutions of chemicals which in strong concentration are primary irritants. There are published lists of concentrations of chemicals which dermatologists have used to determine hypersensitivity; these concentrations, together with the time they are to remain on the skin, are recommended in an attempt to avoid the primary irritant action of the chemical.

The chemicals which are not primary irritants are responsible for the great majority of cases of contact dermatitis caused by wearing apparel, cosmetics, ornaments and the like. They induce a specific skin allergy and thus cause dermatitis.

They may be called sensitizers and were defined as follows by the group of consultant dermatologists:[24]

A cutaneous sensitizer is an agent which does not necessarily cause demonstrable cutaneous changes on first contact but may effect such specific changes in the skin that, after five to seven days or more, further contact on the same or other parts of the body will cause dermatitis.

Substances which are only sensitizers need not be diluted for patch test purposes.

The patch test when used for diagnostic purposes consists in applying a small portion of the suspected substance to a site of normal skin of the patient. This is covered with innocuous impermeable material, which is then sealed to the skin by adhesive plaster. There have been many modifications proposed in order to overcome certain objections.[25]

The diagnostic patch test is performed in the following manner:

22. Feathers:
Peck, S. M., and Soloman, Gustav: Eczema of Infancy and Childhood: I. Contacts as Etiologic Agents, with Particular Reference to Feathers, Am. J. Dis. Child. **48**: 1308 (Dec.) 1933.
Peck, S. M.: Eczema of Infancy and Childhood: II. New York State J. Med. **34**: 1, 1934.
Vaughn, W. T.: Practice of Allergy, St. Louis, C. V. Mosby Company, 1939.
Herrmann, F.; Sulzberger, M. B., and Baer, R. L.: Penetration of Allergens into the Human Skin, New York State J. Med. **44**: 2452, 1944.

23. Patch test:
Downing, J. G.: Legal Aspects of Patch Tests, Arch. Dermat. & Syph. **44**: 63 (July) 1941.
Goldman, Leon: Contact Testing of the Buccal Mucous Membrane for Stomatitis Venenata, ibid. **50**: 79 (July) 1944.
Rostenberg, J., Jr., and Sulzberger, M. B.: Some Results of Patch Tests, ibid. **35**: 433 (March) 1937.
Guild,[25] Rockstad,[25] Schwartz and Peck,[15] Sulzberger and Wise,[15] Consulting Staff.[24]

24. First Meeting of the Consulting Staff of the Dermatoses Investigations Section of the U. S. Public Health Service, Arch. Dermat. & Syph. **45**: 1167 (June) 1942.

25. Guild, B. T.: Window Patch Test, Arch. Dermat. & Syph. **39**: 807 (May) 1939. Rockstad, Ingvold: Patch Tests, New Modification, ibid. **41**: 649 (April) 1940.

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With Liquids.—Saturate a piece of four ply gauze ¼ inch square and apply it to uninflamed skin on the arm or back. The liquid from the gauze should not be permitted to trickle from the patch site. For insulation a 1 inch square of nonwaterproof cellophane is used. (Waterproof cellophane consists of regenerated cellulose coated with a water insoluble resin.) This is sealed to the skin with adhesive plaster about 2 inches square. When smaller pieces of adhesive plaster are used, patches are often lost or there is insufficient contact between the test substance and the skin. The reactions which may result from the adhesive plaster are separated from those resulting from the test substance by the uninflamed skin which is in contact only with the cellophane. In performing a number of patch tests, care should be taken to avoid overlapping of adhesive plaster, as this will cause intensification of the adhesive plaster reaction.

With Powders.—In performing patch tests with powders, the powder is placed on a piece of gauze in order to keep the reaction localized. If the gauze is moistened, it holds the powder better than when dry.

With Solids.—When solids insoluble in water are used, it has been found best to dissolve them in a solvent, making a saturated solution, and wetting a piece of gauze with this solution. The gauze is then allowed to dry before being placed on the skin in order to eliminate the action of the solvent. This procedure deposits the precipitated, finely divided substance on the gauze and brings about better contact with the skin.

When the insoluble solid is of a resinous character, the solution may be painted directly on the skin, the solvent allowed to evaporate and the cellophane and adhesive plaster applied. If the resin adheres firmly to the skin, it is not necessary to cover it with the cellophane and adhesive.

It is usually sufficient to leave the patch on for twenty-four hours, but sometimes when patching with low concentrations or with weak sensitizers it may be necessary to leave the patch on for three or four days, but not for more than five days, as the patient may by that time become sensitized to the patch itself. This is especially true of fabrics which contain no strong irritants and to which most people do not react. The reactions should be read not only on the removal of the patches but every day for at least five days thereafter. This is of special importance in testing fabrics. A later reaction indicates a lesser degree of sensitivity than an early reaction.

PATCH TEST WITH ARTICLES OF WEARING APPAREL

Fabrics.—A piece of the fabric about 1 inch square may be left on for two to five days. The reaction should be read each day up to three days after the removal of the patch. Best results are obtained while the dermatitis is still present. If the patch test is positive, the substances incorporated in the material can be ascertained from the manufacturer and tests performed with each of them. If this is not possible, the following procedure can be taken to determine roughly the class of allergens involved:

Soak the fabric in warm, slightly acid water for twenty-four hours to see if the dye bleeds. If it does, the water extract can be concentrated in vacuo and then a patch test can be made with the concentrated dye. In case the fabric is known to be flameproofed, the flameproofing chemical (if soluble in water) is in the solution.

agreed that the vesicles healed much more rapidly than was expected, and by December 27 healing was estimated as 90 per cent complete. There had been no recurrence of pain seven months later.

CASE 2.—L. B., a white man aged 50, had excruciating pain in the left flank and groin for two days before zoster lesions appeared on March 20, 1944. On this day the first, second,

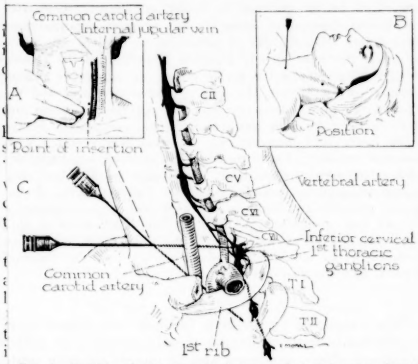

Fig. 1.—Technic of injecting the lower cervical and upper thoracic sympathetic ganglions.

third and fourth lumbar ganglions were infiltrated with 1 per cent procaine hydrochloride according to the technic of Ochsner and DeBakey.[4] Some relief was obtained, but we had evidently selected the wrong segments. The following day the eleventh and twelfth thoracic ganglions were similarly injected and thereafter the patient had no more discomfort of any kind. Once again the lesions healed with conspicuous rapidity. Figure 2 shows the lesions on March 23, two days after the second injection. At this time the patient was having no pain whatever.

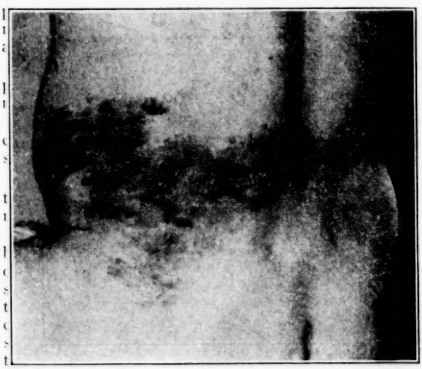

Fig. 2 (case 2).—Lesions forty-eight hours after paravertebral block. At this time the patient was having no pain whatever.

CASE 3.—D. D., a Negro girl aged 7 years, was admitted to Charity Hospital in New Orleans on April 27, 1944 because of a painful herpetic eruption over the left flank and was referred to us by Dr. R. V. Platou. A salve had been previously

4. Ochsner, Alton, and DeBakey, Michael: Treatment of Thrombophlebitis by Novocain Block of Sympathetics: Technic of Injection, Surgery **5**: 491-497 (April) 1939; Therapy of Phlebothrombosis and Thrombophlebitis, Arch. Surg. **40**: 208-231 (Feb.) 1940.

applied to the lesions without benefit, and codeine sulfate was given with only slight relief. On April 28 the first, second and third lumbar sympathetic ganglions on the left side were infiltrated with 1 per cent procaine hydrochloride, and complete relief was obtained in ten minutes. The lesions involuted rapidly and by May 12 had almost completely healed.

CASE 4.—A. P. L., a white man aged 52, was referred to one of us by Dr. Samuel B. Nadler on Oct. 17, 1944 with the lesions depicted in figure 3; this eruption appeared four days before. On the day of admission an attempt was made to inject the right stellate ganglion according to the technic described. Evidently the needle point was incorrectly placed, because only a fleeting Horner's syndrome developed and the skin of the right side of the face did not become warm and dry. Relief from pain was transitory and incomplete. Forty-eight hours later, however, the injection was repeated with excellent results. From then on he required no analgesics and, when seen a week later, stated that he had had only occasional stinging sensations around the periphery of the zoster eruption and healing was estimated as approximately 75 per cent complete. A third stellate block done at this time afforded satisfactory relief. We think now that more complete relief would have been obtained had the superior cervical ganglion also been injected.

TECHNIC

The technic of sympathetic block is not difficult and is practically without danger if only procaine or allied anesthetic drugs are used and if one is familiar with the anatomy. To block the cervicodorsal and the

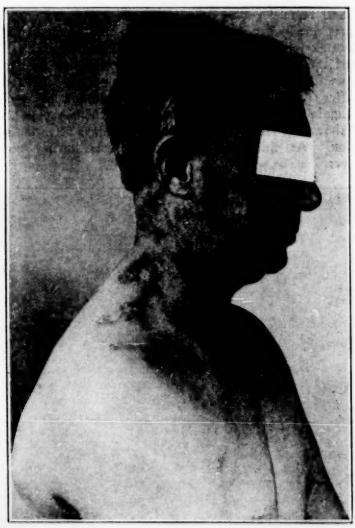

Fig. 3 (case 4).—Location of zoster lesions treated by blocking the cervical sympathetic ganglions.

second and third thoracic sympathetic ganglions we prefer the anterior approach. By this method 10 cc. of 1 per cent procaine hydrochloride is used to flood the region of the cervicodorsal ganglions and another 10 cc. to flood the region of the second and third thoracic sympathetic ganglions. The patient is placed in a supine position with the head in the midline and slightly extended. A point is selected two fingerbreadths above the sternoclavicular junction and just medial to the pulsations of the common carotid artery (fig. 1). A 22 gage spinal puncture needle is then inserted straight down, the operator aiming to hit the transverse process of the seventh cervical vertebra. The needle is then withdrawn about 0.25 cm. If no blood is aspirated,

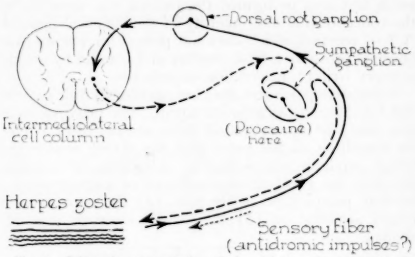

Fig. 4.—Schematic representation of the vicious cycle responsible for segmental vasospasm in herpes zoster.

10 cc. of 1 per cent procaine is injected slowly; the needle is left in place until Horner's syndrome appears; this usually occurs within two or three minutes. The needle is then withdrawn about 1 cm. and directed into the thorax, care being taken to keep it close to the body of the vertebrae near the junction of the transverse process. The region of the second and third sympathetic thoracic ganglions is then infiltrated with 1 per cent procaine hydrochloride.

COMMENT

According to Head and Campbell [5] the essential lesion in herpes zoster consists of an acute inflammatory process involving chiefly the dorsal spinal ganglions together with various degrees of degeneration in the corresponding sensory nerves, dorsal roots and posterior horn cells. This ganglionitis is marked by a round cell exudate, edema, hemorrhage, deterioration of the ganglionic cells and inflammatory changes in the sheaths. The corresponding ventral roots are involved to a much lesser degree, but Bielschowsky [6] found minor changes in the sympathetic chain. The extent of the dermal lesions seems to parallel the intensity of the ganglionitis. Adams [7] has recently reviewed the microscopic picture in detail.

With the location of the primary lesions in mind, it becomes necessary to explain if possible how it is that temporary chemical paralysis of the corresponding sympathetic ganglions, themselves apparently not affected, abolishes pain and promotes healing of the zoster vesicles. The dramatic response to procaine block suggests, of course, that vasospasm must be an important factor, and figure 4 has been constructed to present a tentative hypothesis. Herpes zoster is caused by a filtrable virus closely related to that of chickenpox,[8] although other agents (leukemia, tumor, abscess) are occasionally said to be responsible. In any event the irritative process in the dorsal root ganglion leads to vesicle formation either by peripheral migration of

5. Head, H., and Campbell, A. W.: The Pathology of Herpes Zoster and Its Bearing on Sensory Localisation, Brain **23**: 353-523, 1900.
6. Bielschowsky, cited by Hassin, G. B.: Histopathology of the Peripheral and Central Nervous Systems, Baltimore, William Wood & Co., 1933, chapter 5, pp. 72-73.
7. Adams, R. D.: Pathological Features of Herpes Zoster, Bull. New England M. Center **6**: 12-16 (Feb.) 1944.
8. Goodpasture, E. W., and Anderson, Katherine: Infection of Human Skin, Grafted on the Chorioallantois of Chick Embryos, with the Virus of Herpes Zoster, Am. J. Path. **20**: 447-453 (May) 1944.

the virus itself, as seems likely, or by antidromic stimulation of the sensory nerve. At the same time the cells in the corresponding intermediolateral column are receiving an excessive number of normally directed impulses from the irritated ganglion, a circumstance which results in increased sympathetic vasoconstrictor tone and segmental arteriolar spasm. Local axon reflexes may play a minor role, but the essential point is that procaine infiltration of the sympathetic ganglion interrupts a vicious cycle of nerve impulses. Since it is highly unlikely that the results are due to simple blockage of afferent sensory impulses traversing the sympathetic ganglion on their path to the dorsal root, one must assume that the postinjection hyperemia, however transient, relieves pain by dilution of retained metabolites and enhances dermal healing.

Ranson and Von Hess [9] have shown that a weak stimulus to the proximal end of a cut sensory nerve causes vasodilatation but that when the same nerve is affected by a medium or strong stimulus vasoconstriction is produced. Stricker [10] and others [11] have shown that when the distal end of the severed dorsal spinal root is stimulated erythema occurs. Langley [12] noted that when the distal end of the severed dorsal spinal root was stimulated there appeared a small area of erythema with paleness around it. Clinically similar paleness is noted around the herpetic lesions

We have had no opportunity to employ this method in the management of herpes zoster of the face. Hyndman [13] relieved pain in the distribution of the ophthalmic division of the fifth nerve by ablation of the cervicodorsal ganglion, although section of the posterior root of the trigeminal ganglion had failed to do so. This operation was done on the assumption that all the afferent sympathetic fibers from the "scalp, face and neck enter the central nervous system at or below the first thoracic segment." It should be noted, however, that all of Hyndman's cases were of postherpetic neuralgia and that it seems unlikely that efferent preganglionic fibers to the head leave the cord at this low level. If the theory of segmental vasospasm applies to acute cranial nerve herpes, we would expect anesthetization of the cervical ganglions to be ineffective. Should this prove to be true, Dr. Homer Kirgis has suggested to us that procaine block of the otic and sphenopalatine ganglions might give results.

SUMMARY

1. Four cases of herpes zoster have been treated by infiltration of the appropriate sympathetic ganglions with procaine hydrochloride. In each instance relief from pain was instantaneous and permanent and the lesions healed rapidly.

2. Regional sympathetic block relieves herpetic pain by abolishing segmental vasospasm.

3. The technic of infiltrating the cervicodorsal and second and third thoracic sympathetic ganglions by the anterior approach is not difficult.

9. Ranson, S. W., and Von Hess, C. L.: The Conduction Within the Spinal Cord of the Afferent Impulses Producing Pain and the Vasomotor Reflexes, Am. J. Physiol. **38:** 128-152, 1915.

10. Stricker, S.: Untersuchungen ueber die Gefässnerven-Wurzeln des Ischiadicus, Sitzungsb. d. k. Akad. d. Wissensch. Math.-naturw. Cl. (1876) **74:** 173-185, 1877.

11. Bayliss, W. M.: On the Origin from the Spinal Cord of the Vasodilator Fibers of the Hind Limb and on the Nature of These Fibers, J. Physiol. **26:** 173-209 (Feb. 28) 1901; Further Researches on Antidromic Nerve Impulses, ibid. **28:** 276-299 (July 21) 1902. Langley.[12]

12. Langley, J. N.: Antidromic Action, J. Physiol. **57:** 428-446 (Aug.) 1923; Antidromic Action: II. Stimulation of the Peripheral Nerves of the Cat's Hind Foot, ibid. **58:** 49-69 (Oct.) 1923.

13. Hyndman, O. R.: Postherpetic Neuralgia in the Distribution of Cranial Nerves: Evidence for Sympathetic Mediation and Surgical Cure, Arch. Neurol. & Psychiat. **42:** 224-232 (Aug.) 1939.

THE TREATMENT OF PNEUMONIA WITH SULFONAMIDES AND PENICILLIN

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Until recently papers devoted to penicillin therapy have consisted largely of descriptions of the results obtained with this new chemotherapeutic agent, and the interest with which the reports were studied was enhanced by the great scarcity of the antibiotic. Now, however, we are reaching the point at which most descriptions of therapeutic triumphs are merely repetitious rather than informative. The important objective now is to become familiar with the limitations of our new weapon, to gage its usefulness in comparison with the agents it is replacing and to determine the optimal dosage and mode of administration for various diseases. Our purpose in this report is to consider these factors in relation to one of the diseases for which penicillin is most widely used, namely pneumonia.

Of the pathogenic organisms sensitive to penicillin, one of the most susceptible is the pneumococcus. In vitro its growth is completely inhibited by as little as 0.01 to 0.02 unit per cubic centimeter,[1] and in vivo protection tests have repeatedly demonstrated the remarkable ability of penicillin to combat overwhelming pneumococcic infections in mice.[2]

These experimental results have been confirmed clinically in many patients with pneumococcic pneumonia, but the reports have so far consisted mainly of small groups of cases included among presentations of the results obtained with penicillin therapy in general.[3] The one definitive study reported is that of Tillett, Cambier and McCormack,[4] who treated 46 cases of pneumococcic pneumonia, with three deaths. The results in general were excellent, and specific recommendations were made concerning dosage and routes of administration. Eight patients with pneumococcic empyema were also treated successfully with intrapleural penicillin.

One of the striking achievements of military medicine is the reduction in the mortality rate of lobar pneumonia from 28 per cent during World War I to approximately 0.7 per cent during the present war.[5] Many deaths during World War I were of course caused by staphylococcic and streptococcic pneumonias following influenza, but many of these fatalities could have unquestionably

From the Medical Service, Regional Station Hospital, Fort Bragg, North Carolina.

1. Dawson, M. H.; Hobby, G. L.; Meyer, K., and Chaffee, E.: Penicillin as a Chemotherapeutic Agent, J. Clin. Investigation **20:** 434, 1941.

2. Hobby, G. L.; Meyer, K., and Chaffee, E.: Chemotherapeutic Activity of Penicillin, Proc. Soc. Exper. Biol. & Med. **50:** 283, 1942. Tillett, W. S.; Cambier, M. J., and Harris, W. H.: Sulfonamide-Fast Pneumococci, J. Clin. Investigation **22:** 249, 1943.

3. Bloomfield, A. L.; Rantz, L. A., and Kirby, W. M. M.: The Clinical Use of Penicillin, J. A. M. A. **124:** 627 (March 4) 1944. Dawson, M. H., and Hobby, G. L.: The Clinical Use of Penicillin, ibid. **124:** 611 (March 4) 1944.

4. Tillett, W. S.; Cambier, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. **20:** 142, 1944.

5. Morgan, H. J.: The Internist at War: A Glance at the Record, Ann. Int. Med. **20:** 881, 1944.

been prevented had our modern chemotherapeutic agents been available.

The present study is concerned with 255 cases of pneumonia, 175 pneumococcic and 80 primary atypical, occurring in soldiers at a large army post from November 1943 until March 1945. There were no fatalities. It must be pointed out, however, that in addition to chemotherapy at least two other important factors are partly responsible for this absence of deaths in a fairly large series. One factor is the youth, vigor and general good health and nutrition of the soldier, and the other is the short duration of time that is allowed to elapse in soldiers between the onset of symptoms and the institution of therapy.

COMPARISON OF THE RESULTS OF TREATMENT OF PNEUMOCOCCIC PNEUMONIA WITH SULFADIAZINE AND PENICILLIN

Although a control series was not reported, it was the impression of Tillett and his associates [4] that in cases of pneumococcic pneumonia treated with penicillin there was a more abrupt fall of the temperature to normal and more rapid clearing of the x-ray than in sulfonamide treated cases. It seemed particularly appropriate, therefore, to compare the temperature and x-ray, as well as other factors, in two carefully studied groups of soldiers, one treated with penicillin and the other with sulfadiazine.

TABLE 1.—*Incidence of Symptoms in the Patients with Pneumococcic Pneumonia Treated with Sulfadiazine and Penicillin*

	Sulfadiazine (% of Cases)	Penicillin (% of Cases)
Prodromes	44	52
Sudden onset	90	92
Chill	94	82
Chest pain	94	87
Bloody sputum	97	87
Dyspnea	75	90
Vomiting	38	36
Headache	77	90
Herpes	19	6
Cyanosis	40	34

One hundred patients with pneumococcic pneumonia were treated with sulfadiazine from November 1943 until March 1944, and 75 patients with penicillin from March 1944 until March 1945. Data concerning the age, race, length of service, duration of illness, clinical symptoms and signs and laboratory data are presented in tables 1 and 2. The similarity between the two groups in every category is striking and would be difficult to duplicate except in an organization such as the army, in which age, health, nutrition and environmental conditions are well standardized. Slightly greater differences were present in the types of pneumococci isolated from the sputum and in the incidence of bacteremia, as shown in table 3. The higher types occurred a little more frequently, and the incidence of bacteremia was slightly lower in the penicillin treated cases, but judging from the clinical and laboratory findings (tables 1 and 2) this was not reflected in the severity of the illness.

Sulfadiazine was administered in an initial oral dose of 4 Gm. followed by 1 Gm. every four hours for from five to seven days, the average total being 37.5 Gm. in 6.1 days. Penicillin was administered intramuscularly for three or four days, according to seven dosage schedules, the details of which are presented in table 6. No manifestations of toxicity were noted with either drug.

There were no deaths, so that the usual criterion in pneumonia therapy, the mortality rate, could not be used in evaluating the results. The factors which were carefully analyzed were the temperature, white blood cell count, x-ray, sputum, complications, relapses and general clinical response.

TABLE 2.—*Comparative Data on 100 Soldiers with Pneumococcic Pneumonia Treated with Sulfadiazine and 75 Treated with Penicillin*

	Cases Treated with	
	Sulfadiazine	Penicillin
Age		
18 to 25	51%	57.3%
26 to 30	23%	25.3%
31 to 35	13%	8.0%
Over 35	11%	9.3%
Race		
White	74%	70.0%
Colored	26%	30.0%
Duration of service in months		
1 to 3	41%	49.3%
3 to 6	14%	8.0%
6 to 9	9%	6.7%
9 to 12	7%	5.3%
Over 12	33%	30.7%
Duration of illness prior to treatment		
1 day	16%	22.6%
2 days	39%	44.0%
3 days	23%	20.7%
4 days	15%	9.3%
Over 4 days	7%	4.0%
Average initial white blood cell count	19,200	22,000
Lobes involved		
One	67%	71%
Two	21%	22%
Three	10%	7%
Four	2%	0%

A striking observation was made in connection with the temperature response. With sulfadiazine there was a gradual fall to normal during the first twenty-four to forty-eight hours, the average being twenty-six hours. With penicillin, on the other hand, the initial fall to normal was more abrupt, occurring in an average of only eighteen hours. In over half (57 per cent) of the patients receiving penicillin there was then a secondary rise in the temperature to over 100 F., which lasted for several hours; in contrast only 9 per cent of the sulfadiazine treated cases showed a similar secondary elevation. The average time required for the temperature to return permanently to normal, including the secon-

TABLE 3.—*Types of Pneumococci Isolated from the Sputum and Blood*

	Sulfadiazine (100 Cases)		Penicillin (75 Cases)	
Type	Number	(Bacteremia)	Number	(Bacteremia)
I	5	(3)	14	(1)
II	10		2	
III	6		3	
IV	6	(2)	9	
V	12		5	(1)
VI	1			
VII	14	(1)	10	(1)
VIII	9	(1)	4	
IX	2			
X	1			
XI	..		1	
XII	3			
XIII	2			
XIV	2			
XVII	..		2	
XVIII	1	(1)	1	
XX	..		1	
XXI	1			
XXII	..		1	(1)
XXIII	..		2	
XXV	..		1	
XXVIII	..		2	
Total	75	(8)	55	(4)
	(75%)	(8%)	(73.3%)	(5.3%)

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dary rise, was twenty-eight hours in the penicillin treated cases, which agrees closely with the twenty-six hour average for the sulfadiazine group. The typical course of a patient treated with penicillin is reproduced in chart 1.

Little difference was noted between the two groups in the time required for the white blood cell count to return to normal (under 10,000) and for complete roentgenographic resolution (table 4). From these figures superiority could be claimed for neither penicillin nor sulfadiazine. The early return to normal of both the white blood cell count and x-ray appearance is undoubtedly due in part to the good general condition of the patients and the short duration of the illness.

In 26 of the patients treated with penicillin, attempts were made daily to isolate pneumococci from the sputum by direct typing and mouse inoculation, and it was found that, although perhaps decreased in numbers, viable, virulent pneumococci could be recovered during and following therapy in every instance for as long as sputum could be obtained.[6] Although the methods used were somewhat different, these observations are essentially in agreement with those of Frisch[7] in sulfonamide treated cases.

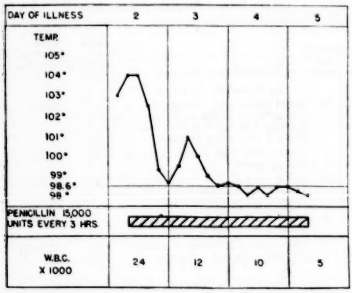

Chart 1.—Typical example of the abrupt initial fall in temperature, with a secondary rise to over 100 F., observed in 57 per cent of patients with pneumococcic pneumonia treated with penicillin.

Complications are listed in table 5. Sterile pleural effusions occurred with approximately the same frequency and severity with the two drugs, and 2 cases of empyema were observed with sulfadiazine, while there were none with penicillin. The 2 instances of spread to another lobe with penicillin both occurred on the second day of therapy, and 1 was questionable because the first x-ray was taken several hours before treatment was begun, so that these changes might have occurred in the interim. With sulfadiazine, however, in 5 cases there was a definite extension to another lobe after the second day of therapy. The 1 case of otitis media occurred two days after penicillin was discontinued in a patient treated for only three days, suggesting that the complication might have been prevented had treatment been continued.

No relapses occurred with sulfadiazine, while with penicillin there were seven. In every instance, however, the dose administered was grossly inadequate. When adequate amounts were administered, clinical relapses did not occur with either drug.

6. These studies of the sputum were made by the Commission on Acute Respiratory Diseases, Fort Bragg, North Carolina, and will be described in detail in a separate publication.

7. Frisch, A. W.: Sputum Studies in Pneumonia, Am. J. Clin. Path. **12**: 16, 1942.

In both groups there were a number of cases, 10 per cent with sulfadiazine and 4 per cent with penicillin, in which the response to therapy was considerably slower than the average. The temperature and white blood cell count declined slowly over a period of four to six days, and symptomatic improvement was similarly retarded. The clinical course of 1 such patient treated with sulfadiazine is presented in chart 2. The explanation of this lack of an immediate response to therapy is not entirely clear, but in some instances it may have been due to an incorrect diagnosis. It is often difficult to differentiate borderline cases of atypical pneumonia, bacterial bronchopneumonia and pneumococcic pneumonia, and the picture is further confused by the fact that there are probably cases of atypical pneumonia in which there is a secondary bacterial infection. Sulfonamide resistant pneumococci could have been responsible for some of the refractory cases; unfortunately, sensitivity tests were not performed. As far as can be determined, penicillin resistant pneumococci have not been encountered clinically.

TABLE 4.—*Duration of Leukocytosis and X-Ray Infiltration*

	Sulfadiazine	Penicillin
Time required for the white blood cell count to return to normal (below 10,000)		
1 day	14%	6%
2 days	41%	37%
3 days	21%	31%
4 days	6%	2%
Over 4 days	18%	23%
Time required for roentgen resolution		
1 week	28%	34%
2 weeks	41%	37%
3 weeks	13%	11%
4 weeks	18%	23%

DETERMINATION OF MINIMAL EFFECTIVE THERAPEUTIC DOSE OF PENICILLIN IN TREATMENT OF PNEUMOCOCCIC PNEUMONIA

Attempts were made to determine the smallest amount of penicillin which would give satisfactory clinical cures in cases of pneumococcic pneumonia. The cases were divided into five groups, with gradually diminishing amounts of penicillin, as indicated in table 6. The clinical results were good until the total dose was reduced to 60,000 units administered over a three day period. With this amount, in 5 cases there were two clinical relapses and 1 failure to respond to treatment; the other 2 patients showed an excellent response. To illustrate the initial effect of these small doses and the failure to prevent a secondary spread of the infection, the course of 1 of the patients in whom there was a clinical relapse is presented in chart 3. These results are in close agreement with those of Tillett and his associates,[4] who also noted relapses when the amount of penicillin administered was less than

TABLE 5.—*Complications Occurring During and Following Therapy of Pneumococcic Pneumonia with Sulfadiazine and with Penicillin*

	Cases Treated with	
	Sulfadiazine	Penicillin
Sterile pleural effusion	10 cases (10%)	5 cases (6.6%)
Empyema	2 cases (2%)	0
Spread of pneumonia to another lobe	5 cases (5%)	2 cases (2.6%)
Miscellaneous	Fibrinous pericarditis (1 case)	Acute otitis media (1 case)

120,000 units in three days. The relation of these observations to the optimal dosage will be considered in the comment.

THE TREATMENT OF PRIMARY ATYPICAL PNEUMONIA WITH PENICILLIN

It is now well established that the course of atypical pneumonia is not altered by treatment with the sulfonamides.[8] The disease is presumably also refractory to penicillin, although certain recent evidence casts some doubt on this supposition. Thomas and his associates have isolated from patients a penicillin sensitive nonhemolytic streptococcus which is thought to be closely associated with atypical pneumonia, although a direct etiologic relationship is not claimed,[9] and it is theoretically possible that the action of penicillin against this organism might be of therapeutic value. Further, a more rapid clinical response and fall in temperature in penicillin treated cases than in nontreated patients is described in a recent report from the South Pacific.[10] The author points out, however, that the results cannot be regarded as more than suggestive since the number of cases is small.

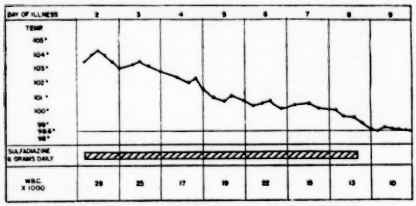

Chart 2.—Patient with the typical clinical picture of pneumococcic pneumonia (type VII) in whom the response to sulfadiazine therapy was much slower than usual.

Accurate evaluation of therapy in atypical pneumonia is difficult because of the extreme variability in the course of the disease. In single, isolated cases an apparent beneficial effect is often noted with penicillin; the course of 1 such patient who was seriously ill and recovered promptly following penicillin therapy is presented in chart 4. In view of the natural variations of the disease, no conclusions can be drawn concerning the value of penicillin in this single case. Therapy can be evaluated only by treating a relatively large number of cases and comparing the results with those of suitable controls.

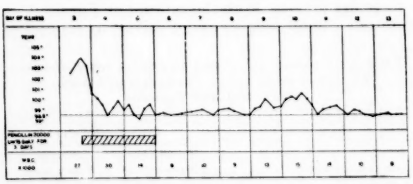

Chart 3.—Clinical relapse in a patient with pneumococcic pneumonia (type XXVIII) who received a total dose of only 60,000 units of penicillin.

Accordingly, 40 patients with moderately severe atypical pneumonia were treated with penicillin 10,000 to 15,000 units every three hours intramuscularly for three days. The criteria used in selection were (1) duration of symptoms of less than five days, (2) initial temperature of over 102 F., (3) characteristic clinical and roentgenographic picture of atypical pneumonia and (4) initial white blood count under 10,000. Forty cases fulfilling the same requirements were selected for controls, and in both groups the time required for the temperature to return to normal following entry to the hospital was determined. The data and results are presented in table 7. The temperature was elevated for an average of 4.5 days for the treated cases as opposed to 5.2 days for the controls, a difference which cannot be regarded as significant. Further, there was no appreciable alleviation of symptoms or more rapid clearing of the x-ray when penicillin was administered. It can be concluded that penicillin has no beneficial therapeutic effect on the course of atypical pneumonia. In seriously ill patients, however, in whom the outcome is uncertain and a secondary bacterial infection might mean the difference between recovery and death, the policy in this hospital is to administer penicillin 10,000 to 15,000 units every three hours intramuscularly until the patient is past the critical stage.

TABLE 6—*Efficacy of Various Dosage Schedules of Penicillin in Pneumococcic Pneumonia*

Group	Number of Cases	Treatment Schedule	Days of Treatment	Total Amount of Penicillin, Units	Failures or Relapses
		Penicillin in Saline			
1	10	30,000 units I.V.; beginning 1 hour later, 20,000 units every 3 hours I.M for 8 doses; then every 4 hours for 18 doses	4	570,000	0
2	20	15,000 units I.M. every 3 hours for 24 doses	3	360,000	0
3	10	15,000 units I.V.; beginning 1 hour later, 10,000 units I.M. every 3 hours for 23 doses	3	255,000	0
4	10	10,000 units I.M. every 3 hours 4 times daily for 3 days	3	120,000	0
5	5	5,000 units I.M. every 3 hours 4 times daily for 3 days	3	60,000	3
		Penicillin in Beeswax Oil			
6	12	100,000 units twice daily for 2 days, then once daily for 2 days	4	600,000	0
7	8	100,000 units once daily for 4 days	4	400,000	4

NEWER METHODS OF PENICILLIN ADMINISTRATION

Intramuscular injections of penicillin at frequent intervals (usually every three hours) are painful to the patient and time consuming for the nurse or doctor. Two methods of avoiding these difficulties which show considerable promise, but which are still in the experimental stage, are the intramuscular injection of penicillin-beeswax mixtures[11] and the oral administration of penicillin in various vehicles.[12]

During the last three months of this study, 20 patients with pneumococcic pneumonia were treated in this hos-

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11. Romansky, M. J., and Rittman, G. E.: Method of Prolonging Action of Penicillin, Science **100:** 196, 1944.
12. McDermott, W.; Bunn, P. A.; Benoit, M.; DuBoid, R., and Haynes, W.: Oral Penicillin, Science **101:** 228, 1945.

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pital with penicillin-beeswax mixtures. The concentration of beeswax varied from 4 to 8 per cent, with 100,000 units of penicillin in each cubic centimeter of the mixture. In 12 patients 1 cc. (100,000 units) was injected every twelve hours for two days and once daily for another two days, a total of 600,000 units in four days (table 6). The other 8 received 1 cc. daily for four injections, a total of 400,000 units in four days. In 16 of the 20 patients the response to therapy was excellent, in 3 there was a clinical relapse following cessation of treatment and in 1 the pneumonia continued to spread in spite of penicillin-beeswax therapy but responded immediately when, after three days, 15,000 units of penicillin in saline solution was administered every three hours. These four unsatisfactory responses to treatment all occurred in the group receiving 100,000 units once a day only, so that for many hours during each day effective concentrations of penicillin were not present in the tissues. It is of interest that these failures occurred with 400,000 units of penicillin in beeswax and peanut oil, whereas with penicillin in saline solution uniformly good results were obtained with a total of only 120,000 units.

The course of a patient who showed a good response to penicillin-beeswax therapy is presented in chart 5. Assays of the blood and urine are included, demonstrat-

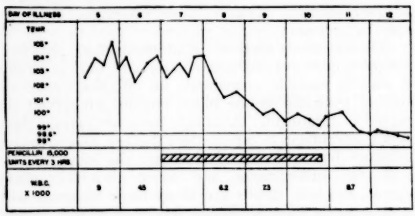

Chart 4.—Patient seriously ill with extensive bilateral primary atypical pneumonia, requiring oxygen therapy, in whom improvement was first noted shortly after institution of penicillin therapy.

ing the prolongation of the action of penicillin. The concentrations of penicillin and beeswax in the present preparations are probably not optimal, and in general it may be said that the outlook for obtaining excellent results with one, or at most two, injections daily seems very good.

We have had no experience with oral penicillin in the treatment of pneumonia, but McDermott and Bunn [12] report excellent results. A considerable amount is destroyed or lost in the intestinal tract, so that the amount required is several times as large as that needed for intramuscular injections. However, increasing production of penicillin, plus the fact that oral preparations do not need to be as highly purified as those used for intramuscular injections, may soon overcome this disadvantage.

COMMENT

In the present study, results obtained in the treatment of pneumococcic pneumonia with penicillin and sulfadiazine were almost identical, the only differences being a more abrupt fall in the temperature, and fewer instances of extension to another lobe during therapy, with penicillin. It is not to be inferred, however, that penicillin and sulfadiazine are therefore of equal value in the treatment of all cases of pneumococcic pneumonia, for such is not the case. The patients in the present series were vigorous, healthy young adults in whom treatment was instituted early and in whom the response to any adequate therapy should be favorable.

It should be further pointed out that these cases are not comparable to those observed in civilian hospitals,

TABLE 7.—*Comparison of 40 Treated and 40 Untreated Cases of Moderately Severe Atypical Pneumonia with Penicillin*

	Untreated	Treated
Average duration of symptoms prior to admission	3.7 days	3.2 days
Average initial white blood cell count	8,800	9,700
Average initial temperature	102.4	102.1
Average days of fever	5.2	4.5

in which the lower types of pneumococci predominate and in which the incidence of bacteremia is much higher than the 5 to 8 per cent in the present series. The absence of deaths is also difficult to evaluate in view of the likelihood that in this group of healthy young adults the mortality rate would have been relatively low with no specific therapeutic measures whatever. A final word of qualification should be added concerning the diagnosis, which is, as pointed out previously, admittedly difficult in borderline cases seen early in the course of the illness, even with the criteria of chills, fever, pleuritic chest pain, rusty sputum, leukocytosis, x-ray infiltration and, in most instances, isolation of pneumococci from the sputum.

The important conclusion to be drawn, then, is that since adequate doses of either drug will produce an

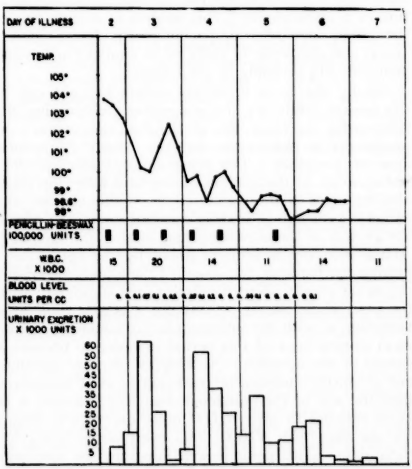

Chart 5.—Response of a patient with pneumococcic pneumonia (type 1) to penicillin-beeswax therapy. Assays of the blood and urine are included.

equally satisfactory and, indeed, almost identical response, the lower cost and greater ease of administration may make sulfadiazine the drug of choice for this group of patients. Once the problems of cost and administration are overcome, however, penicillin will be favored because of its lack of toxicity and the probability that penicillin resistant strains of pneumo-

cocci will be encountered rarely if at all, whereas with the sulfonamides resistant strains occur in 2 to 6 per cent of the cases.[13]

Patients seriously ill with pneumococcic pneumonia should be treated with penicillin because of its greater antibacterial action. No large series is yet available, but from the dramatic results obtained in isolated cases [3] there is every reason to believe that the mortality rate of 6 to 10 per cent in civilian hospitals with the sulfonamides may be significantly reduced by penicillin. In addition to its use for patients seriously ill with pneumococcic pneumonia, penicillin is also the drug of choice at the present time for (1) patients sensitive to the sulfonamides, (2) patients with renal damage, (3) pneumonias caused by sulfonamide resistant pneumococci, (4) pneumonias in which the etiologic organism is the staphylococcus or beta hemolytic streptococcus and (5) complications of pneumococcic pneumonia, including empyema, meningitis and endocarditis.

Whether penicillin and sulfadiazine should ever be given together is questionable and involves the highly controversial subject of the possible synergistic action of penicillin and the sulfonamides. It is agreed that the action of the two together is greater than that of either one alone; the dispute centers about whether the resultant action is merely additive,[14] or whether the two combine to produce an action greater than that of the sum of the two separately, i. e., true synergism.[15] We favor the former view and are of the opinion that the bacteriostatic action of the concentrations of penicillin used clinically is so great that no significant difference is produced by the concomitant administration of a sulfonamide. This subject is reminiscent of the sulfadiazine plus antipneumococcus serum controversy, and the result is likely to be similar; in the end penicillin will probably be used alone.

Among the most important points brought out in the present study are the observations concerning the relationship between the mechanism of recovery in pneumococcic pneumonia and the proper therapeutic dose of penicillin. The presence of viable, virulent pneumococci in the sputum during and following therapy indicates that, similar to the sulfonamides, the action of penicillin is, broadly speaking, merely to inhibit the growth of the organisms and localize the infection. Actual recovery is brought about by the body's own defense mechanisms, the so-called "immunologic crisis" occurring usually about the sixth to the eighth day after the onset of the illness. Therefore it is important with penicillin, as with the sulfonamides, to administer treatment during most of this period in order to prevent a spread of the infection. As long as adequate amounts are given, the duration of treatment is more important than the size of the individual dose; for example, it is more rational to give 10,000 units every three hours for six days than 40,000 units every three hours for three days. This point is well illustrated by the complete absence of clinical relapses in the 100 cases treated with sulfadiazine for an average of 6.1 days. The results with penicillin are not strictly comparable, since the 2 failures to respond to treatment and the 5 clinical relapses were probably due more to inadequate doses of penicillin than to discontinuing therapy too soon. When adequate doses (120,000 units or more) were administered, three days of treatment gave excellent clinical results in these moderately severe cases. From our knowledge of the mechanism of recovery, however, it would certainly seem that, at least in seriously ill patients, treatment with penicillin should ideally be continued for five or six days. In order to conserve penicillin and to allow the patients to sleep through the night, penicillin is often administered only four times a day, allowing a period of almost twelve hours during which, for all practical purposes, no penicillin is present in the tissues. This scheme, first employed in pneumonia by Tillett and his associates,[4] has also been used in the present study and is unquestionably effective in many cases of lobar pneumonia. In the more severe cases, however, treatment should be given every three hours night and day, and the total duration of therapy should be at least five days. Specific treatment schedules which can be recommended are as follows: for moderately severe cases, 10,000 to 15,000 units every three hours four times a day for four to five days, and for seriously ill patients 15,000 to 20,000 units every three hours night and day for five or six days. Of course, if the temperature has not returned to normal and the patient has not shown an adequate clinical response, more prolonged treatment may be necessary.

With the newer methods of administration, penicillin-beeswax mixtures intramuscularly and oral penicillin, it may be possible to maintain an effective concentration of penicillin in the blood stream throughout the period of treatment. Although there are certain theoretical advantages to intermittent therapy, no convincing evidence has appeared to challenge the view that, as with the sulfonamides and other chemotherapeutic agents, the best results are likely to be obtained with a continuous effective blood level. For this reason, and because of the greater ease of administration, the present intermittent therapy will probably soon be replaced by these newer methods.

SUMMARY AND CONCLUSIONS

1. A study of the results obtained in 100 cases of pneumococcic pneumonia in soldiers treated with sulfadiazine and 75 treated with penicillin revealed that the response in the two groups was almost identical, the only differences being a more abrupt fall in the temperature, and fewer instances of extension to another lobe during therapy, with penicillin.

2. In studies designed to determine the minimal effective therapeutic dose of penicillin, 10,000 units four times daily for three days intramuscularly produced clinical cures in every instance, but with smaller doses there were relapses and failures to respond to treatment.

3. The clinical course of 40 patients with moderately severe primary atypical pneumonia, as compared with 40 controls, was not altered by treatment with penicillin.

4. Of 20 patients with pneumococcic pneumonia treated with penicillin-beeswax-peanut oil mixture, 12 made an uneventful recovery following six injections of 100,000 units (1 cc.) given over a four day period. Of the other 8 who received four injections of 100,000 units (1 cc. daily) over a four day period, 4 made an uneventful recovery, 1 failed to respond to treatment, and in 3 there were clinical relapses when treatment was discontinued.

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15. Bigger, J. W.: Synergic Action of Penicillin and Sulfonamides, Lancet **2**: 142, 1944.

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Clinical Notes, Suggestions and New Instruments

CONTINUOUS CAUDAL ANESTHESIA AS A TEST IN THE SELECTION OF HYPERTENSIVE PATIENTS FOR SYMPATHECTOMY

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STATEN ISLAND, N. Y.
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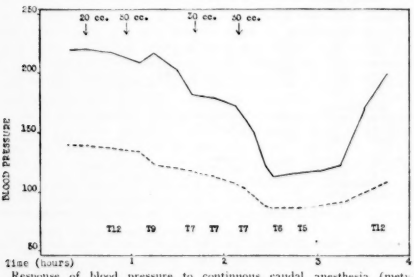
The various methods now employed in the selection of patients for thoracolumbar sympathectomy appear to be unsatisfactory. Certainly no single test has been used which is capable of yielding reliable data as to whether or not sympathectomy will favorably influence hypertension. As the hypertensive state in man "appears to be the result of a number of different factors joining together in an infinite variety of combinations," careful evaluation of the neurogenic component seems essential for a decisive answer to the problem of selection. The sodium amytal, sodium nitrite and cold pressor tests have been found of limited prognostic value in relation to surgery, since they provide an inaccurate index of "sympathetic tone." Thus, poor results have been reported in many cases in which these tests had forecast a favorable outcome.

The observations of Hingson and Edwards,[1] as well as our own,[2] have convinced us that continuous caudal anesthesia may be effectively employed to produce functional denervation of the splanchnic vascular bed similar to the anatomic sympathetic block of the Smithwick operation. Furthermore, if the effects of the two procedures are strictly comparable the caudal anesthesia test might prove of value in identifying those patients who will respond to surgical sympathectomy with a favorable fall in blood pressure.

Accordingly, continuous caudal anesthesia with use of a 1.5 per cent solution of metycaine was carried out on 25 hypertensive patients. The upper level of skin anesthesia was maintained in the region of the fifth or sixth thoracic segments. By this means transient nerve block was obtained of strikingly similar distribution to that more permanently secured by surgical sympathectomy. Eighteen of the 25 patients so studied showed an appreciable fall in blood pressure to normotensive or hypotensive levels, the response suggesting a "neurogenic" origin of the hypertension, as shown in the accompanying chart. In 7 patients there was little or no alteration in the blood pressure as the result of this test, implying a humoral origin of the hyperpiesia ("essential" hypertension).



Response of blood pressure to continuous caudal anesthesia (metycaine). Solid line, systolic; broken line, diastolic; T, thoracic level of anesthesia.

Lumbodorsal splanchnicectomy was performed according to the Smithwick technic on 5 of the "neurogenic" hypertensives and on 2 of the "essential" hypertensives. The caudal anesthesia test appeared to predict accurately the outcome in all 7 cases. Furthermore, the levels of blood pressure obtained under caudal anesthesia showed a striking correlation with the blood pressure readings following surgical sympathectomy, as shown in the table.

Results of Studies

Case	Age	Blood Pressure * Before Test	Blood Pressure * Caudal Test	Blood Pressure * Postoperative †	Comment
1	44	200/130	140/ 90	136/ 90	Grade 3 eyegrounds; normal cardiac and renal functions
2	42	230/126	140/100	150/ 94	Grade 2 eyegrounds; normal cardiac and renal functions
3	21	200/140	164/128	180/130	Grade 4 eyegrounds; early congestive heart failure, poor kidney function
4	36	180/130	90/ 70	96/ 62	Grade 1 eyegrounds; normal cardiac and renal functions
5	48	180/110	176/110	184/108	Grade 1 eyegrounds; normal cardiac and renal functions
6	45	210/130	136/ 86	140/ 92	Grade 2 eyegrounds; normal cardiac and renal functions
7	47	220/140	120/ 84	126/ 90	Grade 2 eyegrounds; normal cardiac and renal functions

* All pressures were measured with the patient lying down.
† Postoperative follow-up was one to six months.

The method appears to be safer than high spinal anesthesia and is more easily controlled. No significant untoward reactions were encountered. It is hoped that other clinics will undertake to evaluate this test further.

Dr. Homer L. Skinner performed the surgical operations.
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From the Cardiovascular and Surgical Services, U. S. Marine Hospital, Staten Island, N. Y.

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2. Southworth, J. L., and Hingson, R. A.: Continuous Caudal Analgesia in Surgery, Ann. Surg. **118:** 945-970 (Dec.) 1943.

A CASE OF HEMOLYTIC ANEMIA RELIEVED BY REMOVAL OF AN OVARIAN TUMOR

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West-Watson and Young [1] in 1938 reported an instance of hemolytic anemia being relieved after removal of a dermoid cyst of the ovary with simultaneous removal of the gallbladder. A splenectomy performed four months before had been without benefit. They felt that removal of the ovarian tumor was responsible for relief rather than removal of the gallbladder, since cholecystectomy, which is performed frequently in hemolytic anemia, apparently does not affect the hemolytic process.

In 1939 Watson [2] reported a case of hemolytic anemia in a 17 year old girl which was not relieved by removal of an ovarian cyst (type not stated) but relief followed splenectomy.

Singer and Dameshek [3] described in 1941 a patient with a hemolytic anemia not benefited by splenectomy but relieved by removal of a dermoid cyst of the ovary six months after splenectomy.

We have recently observed a woman with a similar type of anemia who had cessation of a hemolytic process following removal of an ovarian tumor. At the same operation much of the small intestine was freed from a capsule of fibrous tissue.

REPORT OF CASE

Mrs. C. B., a white woman aged 35, a nurse, first seen at Vanderbilt University Hospital in January 1942, complained at that time of pain at various sites, mostly of the extremities, and of a widespread, painful, erythematous skin eruption. Pain in the calves of her legs had begun four years previously; skin lesions had appeared two years previously, and for one year the patient had had swelling of her face. For six months her hands and forearms had been turning blue and became painful on exposure to cold. There had been no loss of weight.

From the Department of Medicine, Vanderbilt University School of Medicine.

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3. Singer, Karl, and Dameshek, William: Symptomatic Hemolytic Anemia, Ann. Int. Med. **15:** 544 (Sept.) 1941.

In 1939 she had a spontaneous abortion at six weeks gestation; one year later an eight months pregnancy terminated in stillbirth. No information about the fetuses was available. For the previous year menstrual flow had been diminished in amount.

Physical examination on the first visit to this hospital showed her to be well nourished. There was a brownish pigmentation of the skin of the cheeks, neck and anterior axillary folds. There was a fusiform swelling of the fingers, and the overlying skin was shiny and atrophic and in areas was adherent to underlying tissue. There was a blotchy, red discoloration of her hands with focal areas of depigmentation. There was moderate periorbital edema. The thyroid isthmus and right lobe were diffusely enlarged. The heart and lungs were normal. Tenderness was pronounced in the muscles of the arms but was less severe in the muscles of the shoulder girdle and forearms. There were no further significant physical findings. The red blood cell count was 3.63 million per cubic millimeter, with 12 Gm. of hemoglobin per hundred cubic centimeters. The white blood cell count was 5,400 per cubic millimeter, with a normal differential count. The sedimentation rate was not increased. The urine was normal, and an electrocardiogram showed nothing abnormal. Fluoroscopy of the chest revealed no abnormality. Total serum protein was 7.19 Gm. per hundred cubic centimeters, with albumin of 4.33 Gm. and globulin of 2.86 Gm. per hundred cubic centimeters. Basal metabolism rates on two occasions were within normal limits. A diagnosis of dermatomyositis was made at that time.

Late in 1942 the patient was admitted to the Mayo Clinic, where the diagnosis of dermatomyositis was confirmed by muscle biopsy. There she was given "oxygen therapy," wheat germ oil, intravenous typhoid vaccine and a high caloric, high vitamin diet, all without benefit. She was then given sulfathiazole but developed a rash, nausea, edema and fever, so this drug was discontinued.

She was able to continue her work as a nurse until October 1942, when weakness and pain forced her to stop. Three months later she resumed work but had to stop again after six weeks. Throughout 1943 there was gradually increasing disability. In November 1943 her abdominal wall became covered with large vesicles which coalesced, followed by extensive exfoliation.

In January 1944, while in Ohio, she developed acute abdominal distention with nausea and vomiting and was admitted to a hospital, where a diagnosis of intestinal obstruction was made. This was treated by Wangensteen suction, rectal tube and parenteral fluids with gradual relief. She lost 17 pounds (8 Kg.) during a twenty-six day stay in that hospital. She was given one whole blood transfusion from her husband (both being type A) and had a chill. She believed she was jaundiced following this but was not certain. It is not known whether she was anemic at that time. A pelvic mass was felt and was thought to be the cause of the obstruction. She returned to Nashville and was admitted to a local hospital for consideration of operation. There she was found to be emaciated, weak and quite pale. A plain film of her abdomen showed what were apparently gallstones and what was interpreted as enlargement of the left kidney. On admission her red blood cell count was approximately 3 million, with 5 Gm. (?) of hemoglobin. Her reticulocyte count ranged from 8 to 10 per cent. She was given three transfusions of whole blood, with increasingly severe reactions. She became jaundiced after each transfusion, with much nausea and vomiting. Approximately one month after that hospital admission her red blood cell count had fallen to 1.75 million, with a hemoglobin of 5 Gm. She had become greatly debilitated.

It was suspected at that time that she was Rh negative. Such was the case and her husband was found to be Rh positive. She was then readmitted to Vanderbilt University Hospital.

On admission to this hospital on April 11, 1944 the patient appeared chronically ill. Her skin showed the changes of dermatomyositis. The skin and buccal mucous membranes were decidedly pale, as were the scleras, retinas and nail beds. The scleras showed a slight icteric tint. To the right of the umbilicus was a palpable, rounded, tender mass. This was found only intermittently; at times the abdomen was quite flat in this region. On pelvic examination another mass was felt which was thought to be a uterine fibroid.

On admission her red blood cell count was 2.04 million, composed largely of spherocytes; the white blood cell count was 5,500, with a normal differential; hemoglobin was 7.5 Gm.

Urine and stool examinations were essentially negative. A reticulocyte count on admission was 2.6 per cent and one week after admission was 20 per cent. The icterus index was 27.

Blood was sent to Dr. Louis K. Diamond of the Blood Grouping Laboratory in Boston, where confirmation of Rh negativity was obtained. At the same time it was found that her serum agglutinated not only group O, Rh positive cells but also group A and group O, Rh negative cells. It was demonstrated that cold agglutinins were not present. The nature of these panagglutinins has not been determined to date.

Course in Hospital

Date	Red Cells in Millions	Hemoglobin in Grams	White Cells	Reticulocytes, %	Packed Cell Volume, %		Fragility Test (Saline) Hemolysis Begins	Hemolysis Completed
1/20/42	3.63	12	5,400	..	39			
2/../44	3.00	5	.....	8-10				
Three transfusions, with reactions								
3/../44	1.75	5						
Found to be Rh negative and transferred to Vanderbilt Univ. Hospital								
4/ 8/44	2.04	7.5	5,500					
4/10/44	2.09	6	.....	2.6				Hemolysis
						Patient	0.52%	0.38%
						Control	0.46%	0.38%
4/12/44	....	6.8						
4/13/44	....	...	.....	20				
4/14/44	....	7						
4/16/44	....	...	.....	..				
4/17/44	2.35	6.6						
4/18/44	1.93	5.8	.....	20				
4/19/44	2	6						
4/21/44	2.29	6.5						
4/25/44	2	5	8,000					
4/28/44	1.76	5	14,500					
5/ 3/44	2.6	5.8	13,000					
5/ 5/44	2.45	5.8	16,500					
Removal of intestinal obstruction and extirpation of ovarian cyst								
5/ 6/44	1.9	5.4						
5/ 8/44	1.78	4.5	3,800	9				
5/11/44	2.25	...	.....	3.2				
5/12/44	2.40	5.5	....	4				
5/14/44	....	...	.....	..	..		0.48%	0.38%
							0.44%	0.38%
5/15/44	2.04	5.6	4,000					
5/18/44	2.77	5	.....	10				
5/20/44	2.84	7.3	5,000	10.2	26			
5/23/44	3.63	7.8	.....	6	27.5			
5/26/44	3.45	7.5	7,800	8.5	27			
5/31/44	3.17	8.5	8,000	3				
Discharged								
6/ 8/44	3.51	9.8	.....	3				
6/21/44	3.43	9.7						
7/ 3/44	3.10	10						
7/19/44	3.46	10.5						
8/ 4/44	3.84	10.5						
8/16/44	2.97	9.5						
8/28/44	3.97	10.8	.....	8.4				
9/18/44	3.46	10	.....	..	32			
11/15/44	3.80	11						
Readmitted								
11/22/44	3.30	11.8	5,000					
11/23/44	3.50	10.8	9,550					
11/29/44	3.60	10	.....	<1	..		0.48%	0.34%
							0.46%	0.34%
12/ 3/44	4.12	9.7	8,900					
12/13/44	3.37	9	10,700					
Discharged								
2/21/45	4.12	12						

Fragility test showed increased fragility of the patient's cells.

Patient: Hemolysis began at 0.52 per cent, complete at 0.38 per cent.

Control: Hemolysis began at 0.46 per cent, complete at 0.38 per cent.

An attempt was made to demonstrate autoagglutinins, but these could not be demonstrated.

Repeated attempts to find compatible blood for transfusions were to no avail, though all cross matching was done with Rh negative blood. Three lots of pooled plasma were found

to agglutinate her cells. Two lots of type A plasma were found to cause no agglutination and she was given 500 cc. of this on successive days. She went progressively downhill, becoming increasingly anemic. Seventeen days after admission the red blood cell count had dropped to 1.93 million, with a hemoglobin of 5.8 Gm.

It was then suggested by Dr. J. K. David that her pelvic tumor might be a dermoid cyst of the ovary in light of the report of Singer and Dameshek. In spite of her extremely poor condition an exploratory laparotomy was advised. This was performed by Dr. L. W. Edwards on May 5, almost one month after admission. When the abdomen was opened a considerable amount of straw colored, mucoid material was found free in the peritoneal cavity. Much of the small intestine was contained in a large fibrous capsule; in addition to this a large right ovarian cystic tumor was found. The capsule was stripped away, the intestine freed and the ovarian cyst removed. During the first five postoperative days, three transfusions of type A pooled plasma, 500 cc. each, were given without reaction. It was noted on the day after operation that one lot of type A plasma which had caused appreciable agglutination of her red blood cells was at that time entirely compatible. During the twenty-six days following operation, without whole blood transfusions, the red blood cell count rose from 1.9 million to 3.17 million and the hemoglobin from 5.4 Gm. to 8.5 Gm. Reticulocytes dropped from 20 to 3 per cent, and the fragility test became normal with hemolysis beginning at 0.48 per cent and completed at 0.38 per cent saline. No spherical red blood cells were seen at that time. On microscopic examination the ovarian cyst was found to be a pseudomucinous cystadenocarcinoma. She was discharged on the twenty-sixth postoperative day much improved.

Following discharge in June 1944 the patient continued to do well except for slight exacerbations of her dermatomyositis. In November she began having severe cramping pains in her legs, which were partially controlled by the use of quinine. Her red blood cell count rose progressively from 3.17 million at discharge to 3.8 million by the middle of November. Her hemoglobin rose from 8.5 Gm. to 11 Gm. and the packed cell volume from 27 to 32 per cent in this period. Reticulocyte counts remained around 3 per cent.

On Nov. 22, 1944 she was readmitted to this hospital thirty-six hours after the onset of severe abdominal pain, distention, nausea and vomiting. A diagnosis of acute intestinal obstruction was made, and she was operated on several hours after admission. A large adhesive band was found obstructing the lower ileum. This was cut, with immediate relief of the obstruction. The intestine at this time was entirely free and appeared normal in color. There were no signs of recurrence of the ovarian tumor. The postoperative course was complicated only by an acute parotitis, which disappeared after the administration of 280,000 units of penicillin over a three day period.

On this admission the red blood cell count was 3.30 million, hemoglobin was 11.8 Gm. and the white blood cell count was 5,000. Reticulocytes were less than 1 per cent. At the time of discharge on the twenty-sixth postoperative day her red blood cell count was 3.37 million, with 9 Gm. of hemoglobin.

Since leaving the hospital she has had considerable pain in her extremities similar to that suffered earlier in the course of her dermatomyositis. On Feb. 21, 1945 her red blood cell count was 4.12 million, with 12 Gm. of hemoglobin.

COMMENT

It appears highly probable that removal of the ovarian tumor in our patient accounted for the improvement of her hemolytic anemia. That removal of the fibrous capsule about much of the small intestine played any part in relief of the anemia seems most unlikely. Granting that some degree of intestinal stasis was caused, any anemia resulting would be expected to be macrocytic in type.[4] The anemia here described was essentially normocytic and normochromic. Many of the red blood cells were spherical prior to operation. This cell type disappeared following operation. It would seem that some material elaborated by the ovarian tumor acted as a hemolysin. According to the concept of Dameshek and Schwartz,[5] spherocytosis with consequent hemolysis resulted from the action of this "hemolysin" on the red blood cells. Although hemolysis was arrested following removal of her tumor, all of her various agglutinins were found by the Blood Grouping Laboratory of Boston to be undiminished three months after operation.

As far as can be determined, ours was the first instance in which removal of an ovarian tumor alone sufficed to effect pronounced improvement in a hemolytic process. Two other reports mentioned record relief of hemolytic anemia following removal of an ovarian tumor when previous splenectomy had been without benefit. There is another report of failure to relieve hemolysis by removing an ovarian cyst with later relief following splenectomy. Thus a possible synergistic effect of spleen and ovarian tumor is suggested in the cases reported by others. However, it is not possible to state that removal of the tumor alone might not have been effective in the cases in which this operation was preceded by splenectomy.

Two of the three tumors here reported were dermoid cysts; the classification of the other tumor was not stated. Broadly speaking, it is possible to regard many ovarian tumors as one-sided developments of teratomas, dermoid cysts being merely one variety. Hence our patient's tumor was possibly of the same type as described by the authors mentioned.

This can be considered an example of a symptomatic hemolytic anemia as has been reported[3] in leukemia, Hodgkin's disease, carcinomatosis and other conditions. Doubtless the anemia seen so frequently in association with various malignant tumors is often of this type. Failure to classify it as such is probably largely due to inadequate study of the blood. It seems futile to speculate on the possible relationships of her tumor and hemolytic anemia to her dermatomyositis and her anti-Rh agglutinins.

4. Barker, W. H., and Hummel, L. E.: Macrocytic Anemia in Association with Intestinal Strictures and Anastomoses, Bull. Johns Hopkins Hosp. **64**: 215 (April) 1939.

SPONTANEOUS RUPTURE OF THE SPLEEN IN MALARIA

FATAL CASE

CAPTAIN AARON KELLNER, CAPTAIN ELLIOTT HOCHSTEIN AND LIEUTENANT COLONEL A. J. B. TILLMAN
MEDICAL CORPS, ARMY OF THE UNITED STATES

A case report of spontaneous rupture of the spleen during a malarial paroxysm is presented to draw attention to this unusual complication of malaria. The incidence of splenic rupture in malaria is rare. Sporadic cases have been reported from the tropics[1] as complications of chronic malaria or of malignant tertian malaria (Plasmodium falciparum). This case is unusual in that it occurred in New England in a relapse of benign tertian malaria (Plasmodium vivax) which had been of relatively short duration.

REPORT OF CASE

A white man aged 28, a medical technician, was admitted to the A. A. F. Regional Station Hospital, Westover Field, at 4 p. m. on April 22, 1944 complaining of chills, fever and vomiting. His present illness began on April 19, three days prior to admission, with drowsiness, fever, chills and low backache, which the patient attributed to a recurrence of malaria and for which he took 3 grains (0.2 Gm.) of quinine. He was home on furlough at the time and did not think it necessary to seek medical care. The following day he felt better and was able to resume normal activity. On April 21, the day before admis-

5. Dameshek, William, and Schwartz, S. O.: Hemolysins as the Cause of Clinical and Experimental Hemolytic Anemias, with Particular Reference to the Nature of Spherocytosis and Increased Fragility, Am. J. M. Sc. **196**: 769 (Dec.) 1938.

From the Laboratory and Medical Services, A. A. F. Regional Station Hospital, Westover Field, Mass.

1. DeSaram, G. S. W., and Townsend, R. F.: Spontaneous Rupture of the Spleen in Malignant Tertian Malaria, Lancet **1**: 584 (May 8) 1943.

sion, he suddenly had a chill and fever and he vomited several times and was brought to the hospital the following day.

This soldier had been stationed on islands in the South Pacific for sixteen months and had returned to the United States in June of 1943. While in the malarious districts he had taken atabrine daily as suppressive therapy and had not had an attack of clinical malaria. About two weeks after returning to this country and after discontinuing the atabrine therapy he had his first attack of malaria and was hospitalized for four weeks. At this time it was discovered that he was unable to tolerate atabrine in large doses. His second attack occurred three months later when he was hospitalized for two weeks. His third relapse was milder and followed in four months. This took place one month prior to his present illness, which was his fourth recurrence in a period of nine months. The past history and family history were essentially negative. He was born and spent his life in New England. There was no history of recent or old trauma to the abdomen or chest.

Physical examination on the afternoon of admission revealed that the patient was well developed and well nourished and did not appear acutely ill. The temperature was 99.8 F. rectally, the pulse rate 80 and the respiratory rate 20. The skin was of normal texture and had a yellowish tint consistent with previous atabrine therapy. The eyes, ears, nose and throat were normal. There was no nuchal rigidity. The thoracic cage was symmetrical, with no respiratory restriction. The lungs were clear to percussion and auscultation. The heart was not enlarged. The heart sounds were of good quality and there were no murmurs present. The abdomen was soft; the spleen was palpable 1 fingerbreadth below the left costal margin and was not tender; the liver was not felt. The external genitalia were normal. Rectal examination was negative. There was no cervical, axillary or inguinal adenopathy. The extremities were normal, with no evidence of arthritis or muscular weakness. Reflexes were physiologic.

Thick and thin blood smears made shortly after admission showed a small number of ring forms and trophozoites of Plasmodium vivax. The red blood cell count was 4.47 million; hemoglobin 88 per cent (Sahli); white blood cell count 6,500, with 69 per cent polymorphonuclears and 31 per cent lymphocytes. The urine was normal.

The patient did not receive any antimalarial therapy that evening. He had a very comfortable night. At 8:50 the following morning he had a shaking chill which was accompanied by vomiting. His temperature rose rapidly, reaching a peak of 106 F. in two hours, and then began to subside. The pulse rate was 110 to 120 and of good quality. He was seen by several members of the medical service, who thought his condition was satisfactory and saw no cause for alarm. At 11:30 a. m. he began to vomit profusely. Shortly thereafter he complained of numbness of his legs, severe epigastric pain and blindness. There was no pain referable to either shoulder. He then went into circulatory collapse, with a cold and clammy skin and an imperceptible pulse. Air hunger soon became evident. There was no rigidity of the abdomen noted. In spite of heroic therapeutic measures the patient died within thirty minutes. The diagnosis of a ruptured abdominal viscus was entertained only in retrospect, after the patient had died.

Autopsy was performed two hours after death. The peritoneal cavity was found to be filled with 2,500 cc. of fresh and for the most part unclotted blood. The source of the massive hemoperitoneum was a rupture of the spleen. The spleen weighed 400 Gm. and measured 15 by 13 by 4 cm. There was a transverse laceration through the capsule across the midportion of the spleen anteriorly. There were no adhesions between the capsule and the under surface of the diaphragm or any of the surrounding viscera. The capsule of the spleen had been dissected free from the underlying parenchyma, from which it was separated by a small amount of fresh soft blood clot. The capsule readily slipped back over the upper and lower poles of the spleen, completely decapsulating the organ. The spleen itself was of an unusually soft, mushy, almost diffluent consistency. There were several small stellate lacerations of the pulp at the lateral border of the spleen. The cut surface was reddish purple and contained large and prominent malpighian corpuscles. The pulp scraped readily. Sections of the spleen were cut with great difficulty, owing to the extremely soft character of the organ. The liver was not enlarged, and the brain showed no gross abnormalities. The only other findings at autopsy were an obliquely patent foramen ovale, cholelithiasis and old healed minimal apical tuberculosis.

Histologically the spleen and liver showed a considerable increase in reticuloendothelial cells, many of which contained small amounts of brown pigment. The spleen showed a relative decrease in the number of trabeculae, and the cells of the splenic pulp were widely spread apart. There was a small amount of hemosiderin in macrophages about a few of the blood vessels in the brain. No intact malarial parasites could be demonstrated on the sections, and there was no histologic evidence in any of the viscera of plugged or thrombosed capillaries.

COMMENT

The presence of a large number of American troops in regions of the world where malaria is hyperendemic has focused attention on this disease as a leading military and medical problem. The return of thousands of men to this country and their discharge into civilian life will make malaria a disease to be seriously considered in differential diagnosis, even in those parts of the country where malaria was previously rare or nonexistent. The preponderant number of cases of recurrent malaria that are seen in this country are due to Plasmodium vivax. It is worthy of note that malaria due to Plasmodium vivax, commonly referred to as "benign tertian" malaria, may give rise to serious and fatal complications.

Spontaneous rupture of the spleen is not a commonly encountered condition. In a recent review of the literature Zuckerman and Jacobi [2] cite 21 cases of spontaneous rupture of the normal spleen without a history of antecedent trauma. Spontaneous rupture of the diseased spleen is more common [3] and may occur in active cases of typhoid or malaria. It may also occur in any of the diseases causing splenomegaly, such as leukemia, Banti's syndrome or kala-azar. Spontaneous rupture of the spleen has been reported by Ziegler,[4] King [5] and Friesleben [6] in the acute phase of infectious mononucleosis. In the 3 cases which Ziegler reports there was one death; 2 patients were saved by surgical intervention.

Rupture of the spleen in malaria, while it has been reported, is nevertheless an uncommon complication. The increasing incidence of malaria in this country may bring an increase in the frequency of this disastrous complication. It is only by an awareness of its occurrence and an alertness on the part of medical personnel in recognizing and promptly initiating heroic surgical procedures that a fatal outcome can be averted.

The etiologic factors in spontaneous rupture of the spleen when no definite history of trauma can be elicited are speculative. The rupture may be due to minor trauma overlooked or forgotten by the patient. Other etiologic possibilities may be sudden increase in intra-abdominal pressure attendant on violent straining, coughing, sneezing or vomiting. An unrecognized source of trauma may be overzealous palpation of the abdomen during physical examination. The extremely soft mushy spleen that is encountered in acute malaria may be especially vulnerable to these minor stresses. Caution is therefore urged in palpating the abdomen and especially in palpating for the spleen in acute malaria.

The symptoms of acute splenic rupture are those due to irritation of the peritoneal surfaces by the extravasated blood and those due to blood loss. The first group of symptoms manifests itself by sudden pain in the epigastrium or left upper quadrant or by referred pain in the left shoulder. In the 21 cases reported by Zuckerman and Jacobi,[2] vomiting occurred in 12. It was a prominent feature in our case. The second group of symp-

2. Zuckerman, I. C., and Jacobi, M.: Spontaneous Rupture of the Normal Spleen, Arch. Surg. **34**: 917 (May) 1937.

3. Dudgeon, H., Jr.: Spontaneous Rupture of the Spleen, South. M. J. **34**: 1247 (Dec.) 1941.

4. Ziegler, E. E.: Infectious Mononucleosis: Report of a Fatal Case with Autopsy, Arch. Path. **37**: 196 (March) 1944.

5. King, R. B.: Spontaneous Rupture of the Spleen in Infectious Mononucleosis, New England J. Med. **224**: 1058 (June 19) 1941.

6. Friesleben, M.: Splenectomy for Spontaneous Rupture, Deutsche Ztschr. f. Chir. **173**: 48, 1922.

toms is due to acute massive blood loss with the familiar picture of circulatory collapse.

Diagnosis is made by an awareness of the possibility of rupture of the spleen in acute malaria, both malignant and benign, and the immediate recognition of the symptoms. The treatment is immediate splenectomy.

SUMMARY

A patient with a recurrence of Plasmodium vivax malaria sustained an apparently spontaneous rupture of the spleen during a paroxysm and went into collapse, dying in a short while from exsanguination into the peritoneal cavity. The spleen at autopsy was extremely soft and mushy and it is of more than academic interest to know whether the trauma of physical examination or of violent coughing or vomiting may have been a factor in producing the rupture. The degree of parasitemia was very slight and there was no histologic evidence of plugged or thrombosed capillaries in any of the viscera.

ADDENDUM

Since the preparation of the foregoing case report we have been informed by the director of the Army Institute of Pathology that there are 3 similar cases in its files. In 2 of these cases the diagnosis was made post mortem. In the third case the diagnosis was made during life and a splenectomy was performed, resulting in the recovery of the patient.

Council on Industrial Health

THE EFFECT OF FLUORESCENT LIGHT ON VISION

The following statement, submitted to the Council on Industrial Health by the Joint Committee on Industrial Ophthalmology representing the Section on Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology, has been approved for publication.

C. M. PETERSON, M.D., *Secretary.*

Fluorescent lighting has been regarded by physicians and others as possessing harmful qualities not found in other forms of artificial illumination or in daylight. Both the ultraviolet and infra-red components have been suspected. The Joint Committee on Industrial Ophthalmology, after consultation with specialists in the production and use of light, holds the following opinion:

1. The ultraviolet energy from clear blue summer skylight is three to four times as great per footcandle as fluorescent light.

2. Light from fluorescent lamps resembles daylight more closely than that from tungsten-filament lamps. This color resemblance to daylight is a desirable quality.

3. Infra-red energy found in fluorescent lighting as now manufactured produces no known physiologic effect except that due to heating. Fluorescent light generates less heat per candlepower than tungsten lamps.

4. Glare occurs in any system of lighting. Its solution rests with illuminating engineers.

5. Individual differences occur in the level of illumination (footcandles) required to provide a satisfactory degree of visual efficiency and eye comfort. Twenty footcandles is essential for such critical tasks as reading. Higher levels of illumination are desirable for prolonged seeing, for discrimination of fine details and where low contrast prevails. These standards can be readily maintained in working places through use of properly installed fluorescent lighting.

6. Excessive light may produce symptoms of eyestrain in susceptible individuals regardless of source. Constitutional factors should be corrected as well as the amount and kind of light.

7. Noticeable flicker is largely eliminated in modern fluorescent installations.

SUMMARY

Fluorescent light is not harmful to vision. It should not cause eyestrain if properly installed and used.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

NEO-SYNEPHRINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 284).

The following additional dosage form has been accepted:

FREDERICK STEARNS & COMPANY, DETROIT

Solution Neo-Synephrine Hydrochloride, 1 per cent: 1 cc. ampuls and 5 cc. vials. Neo-synephrine hydrochloride 1 per cent, sodium bisulfite 0.10 per cent and sodium chloride 0.6 per cent.

MENADIONE (See New and Nonofficial Remedies, 1944, p. 638).

The following dosage forms have been accepted:

ENDO PRODUCTS, INC., RICHMOND HILL, N. Y.

Tablets Menadione: 1 mg. and 2 mg.

Solution Menadione (in corn oil) 2 mg. per 2 cc.: 2 cc. ampules. Each cubic centimeter contains 1 mg. menadione.

CHLOROAZODIN (See New and Nonofficial Remedies, 1944, p. 125).

The following additional dosage form has been accepted:

WALLACE & TIERNAN PRODUCTS, INC., BELLEVILLE, N. J.

Surface Active Saline Mixture of Azochloramid: 4.7 Gm. envelops. Each envelop containing azochloramid 0.14 Gm., sodium tetradecyl sulfate 0.47 Gm. and buffered saline mixture 4.09 Gm. for the preparation of 473 cc. of isotonic solution.

PENICILLIN (See Supplement to New and Nonofficial Remedies, 1944, p. 18).

The following dosage forms have been accepted:

HEYDEN CHEMICAL CORPORATION, NEW YORK

Penicillin Calcium Salt: 100,000 Oxford unit or 200,000 Oxford unit ampuls or vials.

MCNEIL LABORATORIES, INC., PHILADELPHIA

Penicillin Sodium: 100,000 Oxford units in 20 cc. vials.

CARROLL DUNHAM SMITH PHARMACAL COMPANY, ORANGE, N. J.

Penicillin Sodium Salt: 20 cc. vial containing 100,000 Oxford units, packaged with a 20 cc. vial of isotonic solution of sodium chloride.

THE WARREN-TEED PRODUCTS COMPANY, COLUMBUS, OHIO

Penicillin Sodium Salt: 100,000 Oxford unit vials.

COMMERCIAL SOLVENTS CORPORATION, NEW YORK

Penicillin Sodium Salt: 100,000 Oxford unit vials.

Penicillin Calcium Salt: 100,000 Oxford unit vials.

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

The following dosage form has been accepted:

WYETH INC., PHILADELPHIA

Tablets Sulfadiazine: 0.5 Gm.

CONTRACEPTIVE JELLIES AND CREAMS (See New and Nonofficial Remedies, 1944, p. 339).

The following dosage form has been accepted:

CONTRA CREME AND DIAPHRAGM CO., SEVERNA PARK, MD.

U. S. trademark 355,838.

Contra Creme: A stearic acid cream having a p_H of 7.3, packaged from the formula:

Phenylmercuric acetate	0.06%
Triethanolamine	0.06
Glycerin	2.5
Glycol monostearate	3.5
Stearic acid	12.0
Distilled water to make	100.00

Dosage.—An applicator which is included in the package is attached to the tube and half filled with the creme. The contents of the applicator are then inserted carefully into the vagina.

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SATURDAY, AUGUST 25, 1945

THE WAR ENDS

Suddenly the war ended. Men and women were mostly jubilant; some sorrowful; some even apathetic, with a feeling of exhaustion. The control over gasoline was removed; almost immediately roads were overwhelmed with traffic. Along the curbs stood motor cars with tires that burst or springs that cracked or engines that stuck—reminders that motoring will have to await a return to normalcy. So also with human beings—the stresses and strains of the war reveal themselves in a variety of inadequacies—combat neurosis was not limited to the military services.

The end of the war in Europe brought to the headquarters of the American Medical Association a veritable deluge of letters from medical officers urging that steps be taken at once to insure their instant separation from the service. Occasionally a wife wrote saying "You got my husband into this; now you get him out!" The letter from five medical officers in England, published in The Journal, stimulated groups here and there in various military installations to send similar communications. Several were received signed by more than a score of medical officers ranging from lieutenant colonels to lieutenants. Now the war is over—and the planning that contemplated a war ended in Europe must be done over for a war ended also in the Pacific.

The wounded are still coming home. For maximum recovery the armed forces carry the wounded to centers where they receive the attention of specialists. The Army Medical Department has already indicated that replacements for what the Army calls "scarce specialists" are not available.

War's end finds many, many questions of vital interest to American medicine as yet unsettled. The supply of medical and premedical students; the disposal of Army and Navy surplus medical supplies; a proper organization and system for medical services to veterans; the maintenance of intensified, coordinated research; the redistribution and relocation of returning medical officers; the provision of adequate numbers of residencies in the specialties; the development of medical care in the areas of occupation; the reestablishment of interchange of medical information throughout the world—these are but a few of the many problems that demand prompt consideration, careful planning, possible solution.

Much proposed legislation affecting medical care in postwar America is already before the Congress. New measures tremble in the minds of Senators and Congressmen and in the thoughts of personnel in governmental agencies who seek new fields to conquer. The Office of Defense Transportation relaxed to the extent of permitting groups of 150 individuals to attend conventions. Such relaxation does not, however, permit the assembling of the House of Delegates of the American Medical Association. Yet an early meeting of this body is desirable so that the policies of the Association regarding many problems may be established through its democratically selected official group.

These are truly, even as in war, times that try men's souls. Scientifically minded physicians will realize that now, even as in war, haste must be made slowly. With sympathetic understanding, with the determination to see the job through to its fortunately happy ending, with the resolve to sink individual desires just a little more for the common good, let us practice more forbearance, so that our world may be that much sooner again a well ordered civilization.

V 12
1945

DIABETIC NEUROPATHY

Although pathologic conditions of the peripheral nerves have long been recognized, little unanimity prevails concerning the etiology and symptomatology of such conditions. So-called diabetic neuropathy has been considered by some to be the result of degenerative changes resulting from the disease of the peripheral arteries, by others the result of nutritional deficiency resulting from dietary modifications. The subject has been investigated anew by Rundles[1] in the medical wards of the University Hospital of Ann Arbor, Mich. Among some 3,000 diabetic patients treated since 1936, the diagnosis of diabetic neuropathy was made in 125. Most diabetic patients who develop organic disease of the peripheral nerves have apparently had antecedent periods of grossly neglected or poorly managed treatment. The disordered metabolism of diabetes seems to be the etiologic factor in this complication. Severe polyneuropathy was precipitated, sometimes acutely, after periods of diabetic neglect, by common infections, surgical procedures and other events capable of aggravating the severity of diabetes. Not only may the

1. Rundles, R. W.: Diabetic Neuropathy: General Review with Report of 125 Cases, Medicine **24**:111 (May) 1945.

peripheral motor and sensory neurons be involved, according to Rundles, but also spinal nerve roots, autonomic pathways concerned with temperature regulation, postural blood pressure adjustment, vasomotor control and intestinal and bladder function. He reports that he has not seen a patient in whom diabetic neuropathy actually preceded the appearance of diabetes mellitus. This observation is in agreement with that of Joslin and Root, who state that the symptoms of diabetic neuropathy always start during a time of uncontrolled diabetes.

Rundles finds that diabetic neuropathy tends to occur in patients with mild diabetes, many of whom have had neither diabetic acidosis nor coma, as well as in those with more severe diabetes. In 25 of his cases there had been no diabetic treatment at all before the hospital admission. Of the remaining patients who had some treatment, every one seemed to have received only what would be called poor treatment. Liver enlargement was found in 38 patients with diabetic neuropathy, excluding those with cardiac, biliary tract and other recognized hepatic disease. Among early symptoms were muscular cramps, aching and muscular weakness, especially of the legs, and these symptoms were characteristically made worse on exposure to cold and at night. The lower extremities were affected more severely, almost without exception. The peroneal nerve was more vulnerable than the tibial, the ulnar more vulnerable than the radial or median. Occasionally symptoms occurred predominantly in the pudendal, femoral or intercostal nerve areas, or asymmetrical areas in the extremities. With uncontrolled diabetes the tendency was toward increasing severity and persistence of symptoms. Events which seemed to produce or precipitate neuritic changes in this group were severe upper respiratory infections, influenza, pneumonia, pyogenic infections, toxic hyperthyroidism, diabetic acidosis, diabetic coma and surgical operations. Diminished or absent tendon reflexes constituted the commonest neurologic abnormality. The cutaneous sensibilities were blunted peripherally in about half of the patients. Pronounced muscle tenderness was present in 46 cases. The vibratory sense at the ankles was diminished in 37 patients and absent in 20. Complete foot drop was present in 10 cases. The abnormal pupils were in most instances miotic, reacting sluggishly to light, better on accommodation. Irregular and unequal pupils were observed. Thirty-nine spinal fluid examinations were made in 31 patients. Ten fluids were normal, while 13 had excess total protein ranging from 48 to 80 mg. per hundred cubic centimeters. Disturbed gastrointestinal function appeared to be a common accompaniment of diabetic neuropathy and one which the author, in view of the other evidence of disturbed autonomic nerve function, as well as the high incidence in the same patients of genitourinary and sphincter abnormality, considered the result of autonomic nerve disease.

Thirty-two of the patients in this study had genitourinary and sphincter disturbances. Complete lack of sexual potency was recorded in 19 patients, and this often preceded any other symptom of peripheral nerve disorder. Eighteen patients were found to have an atonic type of bladder paralysis. Cystometric examinations in 13 of these showed impaired or absent sense of feeling, low expulsive force and an increased bladder capacity. The sphincter disturbances appeared to be the result of involvement of the pudendal nerve. The bladder paralysis of diabetic neuropathy is an atonic neurogenic paralysis similar to that seen in tabes dorsalis, pernicious anemia with peripheral nerve and posterior column disease and alcoholic neuropathy.

Some of the patients with diabetic neuropathy exhibited unusual degrees of peripheral sympathetic nerve damage, as revealed by sweating deficiencies, loss of vasomotor and pilomotor control, dependent edema and certain types of skin alteration. This type of edema is presumably due to involvement of the vasomotor nerves. Defective orthostatic regulation of the blood pressure was found in 8 of the patients. The blood pressure in the supine position was usually normal, but the systolic and, to a lesser degree, the diastolic pressure declined precipitously on standing, causing faintness, dizziness and syncope.

The successful treatment of diabetic neuropathy requires expert diabetic management. Rundles found that administration of insulin was the most effective means in the control of this complication. He insists that it should be given at least for the duration of the active neuritic disease. Benefit was not observed from the addition of vitamins, and in particular of thiamine. This observation lends support to the opinion of Meiklejohn [2] as to the role of thiamine in the causation of polyneuritis. A poorly understood and disturbing phenomenon encountered in the treatment of diabetic patients with associated neuropathy is the acute intensification of the neuritic disease which sometimes occurs shortly after control of the diabetes is undertaken. Neuritic disease may also appear for the first time in those with a history of prolonged diabetic neglect a few weeks after treatment is begun.

This study points out the association of diabetic neuropathy with chronic unregulated diabetes and suggests a metabolic cause, the nature of which, however, has not thus far been elucidated. The author emphasizes that diabetic neuropathy, as well as retinopathy and hepatomegaly in their early stages, are reversible changes, provided they are recognized early and are properly treated.

2. Meiklejohn, A. P.: Is Thiamine the Antineuritic Vitamin? New England J. Med. **223**:265 (Aug. 22) 1940.

THE CELLULAR SOURCES OF ANTIBODIES

The production of antibodies in lymph nodes was first demonstrated by McMaster and Hudack [1] by grinding lymph nodes of 20 to 30 mice with sand and determining antibody titers in the extract. The observations of McMaster and Hudack were confirmed by Ehrich and Harris [2] by comparing antibody titers in the pad of the hind foot of the rabbit (which was the site of injection of antigen), the lymph contained in the peripheral lymph vessels, the popliteal lymph node (the only node regional to the site of injection), the efferent lymph and the blood serum.

As to the cells involved in antibody formation, Ehrich and Harris first showed that the cellular response in the lymph node during antibody production was chiefly a lymphocytic one, and the simultaneous rise of cells in the efferent lymph from about 18,000 per cubic millimeter of lymph to 60,000 or more was almost entirely lymphocytic (more than 99 per cent of all cells were lymphocytes). Following this observation, Harris, Grimm, Mertens and Ehrich [3] demonstrated that, during antibody formation in the lymph node, antibodies were contained largely in the lymphocytes, the supernatant lymph plasma containing only a fraction of the antibodies present in the lymph.

In accord with the observations of Ehrich and his associates, Dougherty, Chase and White [4] noted that after repeated intra-abdominal injections with sheep erythrocytes the cells from pools of the minced inguinal, axillary, cervical and mesenteric lymph nodes and thymus contained about double as much antibody as the serum of these animals. Recently White and Dougherty [5] and Kass [6] showed that cells from pools of minced lymph nodes also contained normal gamma globulin. Though these cells probably consisted mostly of lymphocytes, a considerable number of monocytes and probably granulocytes must have been present also. Their contention that the antibodies and gamma globulin were contained in lymphocytes may be regarded as valid, however, in the light of the earlier work of Harris, Grimm, Mertens and Ehrich, whose method furnished them with an almost pure strain of lymphocytes (more than 99 per cent of all cells were lymphocytes).

Dougherty, Chase and White came to the conclusion that "antibodies are concentrated in lymphocytes," "the lymphocyte functioning as a carrier of antibody," and that "the active production of antibodies by lymphocytes has not been established." However, Ehrich and Harris [7] pointed out that the reticuloendothelial theory of antibody formation was not really supported by evidence, but their own observations as well as all the older facts fitted better into a lymphocytic theory of antibody formation, in which possibly the granulocyte as well as the macrophage also played an essential role.

Whatever conclusion will finally prevail, it may now be regarded as established that the lymphocyte is not merely an undifferentiated hemocytoblast but has something to do with gamma globulin and antibodies. It either stores or produces these globulins. The evidence available at present favors the latter theory.

1. McMaster, P. D., and Hudack, S. S.: J. Exper. Med. **61**: 783 (June) 1935.
2. Ehrich, W. E., and Harris, T. N.: J. Exper. Med. **76**: 335 (Oct.) 1942.
3. Harris, T. N.; Grimm, E.; Mertens, E., and Ehrich, W. E.: The Role of the Lymphocyte in Antibody Formation, J. Exper. Med. **81**: 73 (Jan.) 1945.
4. Dougherty, T. F.; Chase, Jeanne H., and White, Abraham: Demonstration of Antibodies in Lymphocytes, Proc. Soc. Exper. Biol. Med. **57**: 295 (Nov.) 1944.
5. White, Abraham, and Dougherty, T. F.: Effect of Prolonged Stimulation of Adrenal Cortex and of Adrenalectomy on Numbers of Circulating Erythrocytes and Lymphocytes, Endocrinology **36**: 207 (March) 1945.
6. Kass, E. H.: The Occurrence of Normal Serum Gamma Globulin in Human Lymphocytes, Science **101**: 337 (March 30) 1945.
7. Ehrich, W. E., and Harris, T. N.: Science **101**: 28 (Jan. 12) 1945.

Current Comment

THE AUTOMOBILE NUMBER—1906

On April 21, 1906 THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION—circulation 45,000 copies—issued a special number called the Automobile Number. A facsimile, prepared by the Advertising Department of the American Medical Association, is now being circulated to persons interested in the promotion of motor cars and accessories. The facsimile will take many an American physician back to the early days of his trials and tribulations with the motor cars of a vintage of three decades ago. Some of the amazing articles in this issue bear such interesting titles as "The Auto Too Much Trouble to Keep in Order," by F. A. Swezey, M.D., Wakonda, S. D.; "Synopsis of a Chicago Experience," by Arthur R. Edwards, M.D., Chicago; "Four Years' Success with a Steam Car," by J. G. Henry, M.D., Winchendon, Mass.; "Tires and Roads Are the Chief Automobile Troubles," by William Allen Pusey, M.D., Chicago; "Statistics on Auto, Horse and Pulse," by Charles P. Sylvester, M.D., Dorchester, Mass. In an interesting article entitled "The Physician Who Should Not Purchase an Auto" W. W. Beveridge, M.D., Asbury Park, N. J., asserts that the careless physician cannot run an auto. There are some striking comparisons between the use of the automobile and of the horse in medical practice. Reproductions of the advertisements of that day add to the interest of the text. The illustrations reveal not only the strange motor cars of 1906 but some demonstrations of what was considered a natty costume for a physician of that day. A copy of this interesting reproduction is available at 25 cents to those physicians who will address their request to the American Medical Association.

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NUTRITION OF SCHOOL CHILDREN

Discussion of the part played by nutritional disorders in the rejections of young men for military service directs attention again to the importance of proper nutrition during the period of growth. Too little thought has been devoted in the past to this aspect of child care. The need for improvement is emphasized by recent surveys made on the dietary habits and nutritional status of children in this country. The Florida State Board of Health [1] reports a survey conducted early this year in various counties throughout the state. Over 2,000 children of rural and urban communities from grades 1 through 12 were examined for the presence of specific signs of nutritional deficiencies and anemia. The incidence of such findings was disconcertingly high, the more so because they occur in an area where sunshine and fresh produce should be plentiful. For example, in some sections well over 50 per cent of the children showed at least slight signs of rickets and also indications of vitamin C deficiency. In one isolated rural area 50 per cent of those examined had gum signs indicative of a lack of vitamin C. The frequency with which signs suggestive of other deficiency states such as the roughened skin or granulated eyelids of vitamin A deficiency and the angular stomatitis of riboflavin need was as high as 64 per cent for vitamin A and 85 per cent in the case of riboflavin in some of the nutritionally poorest groups. Anemia was not encountered as frequently in these children as the more specific entities, although the hemoglobin levels of Negro children were found to be generally lower than those of the white children in the same area. A concurrent dietary survey was made to determine the types of foods eaten by Florida school children. The information secured by this means corroborated the observations made on the children themselves. Not only were many valuable types of foods such as colored vegetables, citrus fruits and milk missing from the diet lists of a goodly proportion of the children questioned, but the reports show also that many children go without one meal during the day, usually the breakfast, or eat a breakfast which is totally inadequate. Facts of similar import are revealed from the national survey of children's diets made by the *Ladies Home Journal* as reported in that publication.[2] Here again it was found that a distressingly high percentage of children from all types of homes receive meals which are poorly selected. These studies show that many children are not receiving their share of the benefits of this country's resources in the way of good foods for the maintenance of good nutrition. Scientific investigation has demonstrated the dietary needs of children and adults for optimal health. Invariably the foods can be made available if the proper knowledge and interest are applied. The recent authorization of Congress for the expenditure of $50,000,000 by the Department of Agriculture to continue school lunch programs for the coming year will no doubt assist local groups to provide adequate lunches for children in all schools participating. The extent of the problem calls for more and more communities to avail themselves of all means of improving the nutrition of their children if the health and efficiency of future generations are to be safeguarded.

1. Florida Health Notes **37**, May 1945.
2. Ladies Home Journal, October 1944.

OXIDATIVE CAPACITY OF THE BODY

Determination of the levels of pyruvic and lactic acids in the blood has been of use in studies related to carbohydrate metabolism and thiamine deficiency. The applicability of this procedure has been extended by the work of Friedemann and his associates,[1] in which it was shown that these tests can be made under more normal conditions of activity than the fasting state. The effects of such factors as food, activity and anoxia were tested. Hourly blood samples were taken on 10 subjects eating regular meals and performing their tasks of office and laboratory work. The pyruvic and lactic levels rose to a maximum from one to two hours after an average meal and returned to the original level in three to four hours, roughly paralleling the blood sugar level, but the lactic-pyruvic ratio remained essentially constant throughout. Further observations on persons engaged in laboratory and office work and on medical students indicated that light activity does not materially affect the lactic-pyruvic ratio, although fluctuations from the mean were found in the period immediately after meals as well as later. The arithmetical mean of this ratio for these active subjects was nearly identical with that found in 16 hospital patients confined to bed over an extended period, in spite of their differences in activity. In studies made on a trained runner the lactic-pyruvic ratio after walking a mile rapidly closely approximated that observed in sedentary workers, while the ratio rose sharply with the greater demands for oxygen incident to increasing the speed of running the mile. Of particular interest are the values obtained under simulated conditions of high altitude. Below 15,000 feet the ratio of these acids remains unchanged, whereas above this altitude the lactic acid content of the blood rises to produce an increase in the lactic-pyruvic ratio. That this is related to the anoxia produced was demonstrated by the administration of oxygen or return to 10,000 feet altitude, in which case the ratio returned to normal. This evidence of disruption in the oxidative processes of the body at altitudes previously known to be incompatible with life now offers a physiologic explanation for this well established fact. These observations made under varying conditions of oxygen requirement support the author's [2] contention that the lactic-pyruvic ratio serves as a measure of the relative oxidative conditions of the body. Further application of this procedure may be expected to provide information on such controversial questions related to oxidative capacity as physical fitness and the use or abuse of rest as a therapeutic agent.

1. Friedemann, T. E.; Haugen, Gladys E., and Kmieciak, T. C.: III. The Level of Pyruvic and Lactic Acids and the Lactic-Pyruvic Ratio in the Blood of Human Subjects: The Effect of Food, Light Muscular Activity and Anoxia at High Altitude, J. Biol. Chem. **157**: 673 (Feb.) 1945.
2. Friedemann, T. E., and Barborka, C. J.: The Significance of the Ratio of Lactic to Pyruvic Acid in the Blood After Exercise, J. Biol. Chem. **141**: 993 (Dec.) 1941.

MEDICINE AND THE WAR

ARMY

CIVILIAN SPONSORED ARMY TECHNICAL UNITS TO BE CONTINUED

In a recent announcement by the War Department, it was stated that army technical units sponsored and manned by civilian institutions and organizations will not be disbanded after the war. The War Department granted authority early in the war to numerous civilian institutions and organizations to sponsor military units which required personnel with a high degree of professional or specialized training. In general, this authority was confined to the fields of medicine, motor and rail transportation, motion pictures, motor maintenance and communications.

Following is a list of the medical units now serving in the Army of the United States which will go on a reserve status when the Army is demobilized after the war:

2d Evacuation Hospital—St. Luke's Hospital, New York.
7th Evacuation Hospital—New York Post-Graduate Hospital, New York.
9th Evacuation Hospital—the Roosevelt Hospital, New York.
12th Evacuation Hospital—Lenox Hill Hospital, New York.
18th Evacuation Hospital (inactive)—Methodist Hospital, Indianapolis.
22d Evacuation Hospital (inactive)—Milwaukee County Hospital, Wauwatosa, Wis.
25th Evacuation Hospital—West Suburban Hospital, Oak Park, Ill.
27th Evacuation Hospital—University of Illinois, Urbana, Ill.
35th Evacuation Hospital—Gallinger Municipal Hospital, Washington, D. C.
38th Evacuation Hospital—Charlotte Memorial Hospital, Charlotte, N. C.
45th Evacuation Hospital—West Suburban Hospital, Oak Park, Ill.
46th Evacuation Hospital (inactive)—University of Georgia, Augusta.
48th Evacuation Hospital—Rhode Island Hospital, Providence.
49th Evacuation Hospital (inactive)—Starling Loving, University of Ohio, Columbus.
50th Evacuation Hospital (inactive)—Worcester City Hospital, Worcester, Mass.
55th Evacuation Hospital (inactive)—Anker Hospital, St. Paul.
56th Evacuation Hospital—Baylor University Medical School, Dallas, Texas.
73rd Evacuation Hospital—Los Angeles County General Hospital, Los Angeles.
77th Evacuation Hospital—University of Kansas Hospital, Kansas City, Kan.

64TH MILITARY GENERAL HOSPITAL CITED

The Meritorious Service Unit Plaque was recently presented to the 64th Military General Hospital, which is sponsored by the Louisiana State University School of Medicine. Its medical officers are members of the faculty and alumni of the school. The 64th General Hospital was cited "for superior performance of exceptionally difficult tasks and outstanding devotion to duty in the Peninsular Base Section for the period Aug. 1, 1944 to Oct. 1, 1944. This medical unit was the first hospital in line of evacuation of casualties from fighting in the Arno River sector. This hospital quickly adapted itself to field hospital technics. From Aug. 1, 1944 to Oct. 1, 1944 the professional service of the hospital functioned on a twenty-four hour basis. The superior care of medical patients and battle casualties was consistent with the unselfish ideals of the medical service of the United States Army. With rigid discipline and full knowledge of and devotion to its mission the 64th General Hospital upheld the highest traditions of the United States and of the Allied Nations."

MEDICAL MEETING HELD IN SICILY

A medical meeting was held at the Reale Accademia Peloritana, Messina, Sicily, on June 14 at which many papers were read and discussed and new discoveries announced. Dr. Domenico Pisani is the head of the Accademia.

HOLD MEETING AT U. S. ARMY GENERAL HOSPITAL, CAMP PICKETT

Army medical men recently held a get-together at the U. S. Army General Hospital at Camp Pickett, Va., with a trio of prominent civilian medical specialists and exchanged views on topics ranging from streamlined methods of treating complicated fractures and tropical diseases through the postwar medical world picture. Dr. Guy Leadbetter, president-elect of the American Academy of Orthopedic Surgeons and associate professor of surgery at George Washington University, Washington, D. C., demonstrated a new technic he has developed for correcting ununited fractures of the hip bone by operating on a soldier patient. Besides Dr. Leadbetter, the visiting medical men were Dr. William Harvey Perkins, dean of the Jefferson Medical College of Philadelphia, Dr. Lewis C. Scheffey, professor of gynecology at the same institution, and Col. Walter D. Wise, surgeon consultant of the Third Service Command.

Major Vladimir G. Urse, chief of the neuropsychiatric section of the General Hospital at Camp Pickett and one of several army physicians participating in the round table discussion, stressed the increasing importance of further study of the relationship between stomach disorders and psychoneuroses. The individual must be considered as a total organic being, inclusive of his situation, in diagnosis, he said.

CHIEF ADMINISTRATIVE OFFICER FOR THE OFFICE OF THE SURGEON GENERAL CITED

Col. Joseph Carmack, formerly of San Antonio, Texas, was recently awarded the Cross of Knight Commander, Order of the Crown of Italy, in recognition of his meritorious services during the Italian campaign. In the official citation Colonel Carmack, chief administrative officer for the Office of the Surgeon General, ETOUSA, was praised for his long and meritorious service in the campaign which saw the liberation of Italy.

BRAZILIAN AIR SURGEON VISITS SCHOOL OF AVIATION MEDICINE

Brigadeiro do Ar Angelo Godinho dos Santos, Air Surgeon of Brazil, and his aides, 1st Lieut. Fernando dos Santos and 2d Lieut. Jose dos Santos, visited the AAF School of Aviation Medicine, Randolph Field, Texas, during a three week tour of army and navy medical installations throughout the United States. Accompanying Brigadeiro Godinho are Brig. Gen. G. Reinartz, commandant of the School of Aviation Medicine, Lieut. Col. William A. Glasier, from the office of the Air Surgeon, and Major Andrew Masset, interpreter.

MAJOR TRYGVE GUNDERSEN SUCCEEDS COLONEL DERRICK T. VAIL

Major Trygve Gundersen, formerly consultant in ophthalmology, Mediterranean Theater of Operations, and ophthalmologist of the Sixth General Hospital, was recently assigned to the Office of the Surgeon General as chief, ophthalmology branch, Surgical Consultants Division. He replaces Col. Derrick T. Vail, who will become professor of ophthalmology and head of the department of ophthalmology, Northwestern University, Chicago.

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THE EMERGENCY MEDICAL CARE OF ARMY PERSONNEL

Procedure to Be Followed by Civilian Physicians and Hospitals

Army personnel spend various lengths of time on leave or furlough at their respective homes, some of whom no doubt will require medical attention during this period. When possible, such personnel should be referred to the nearest federal medical installation for care and treatment. If the condition of the patient is such that immediate treatment or hospitalization is necessary, civilian medical attendance is authorized at public expense under existing regulations. This does not apply to Army personnel who are absent without authorized leave or to those who obtain elective medical treatment in civilian hospitals or by civilian physicians.

Service Command Surgeons

Location	*Component States*
Service Command Surgeon Headquarters First Service Command 808 Commonwealth Avenue Boston 15	Maine New Hampshire Vermont Massachusetts Rhode Island Connecticut
Service Command Surgeon Headquarters Second Service Command Governors Island New York 4	Delaware New Jersey New York
Service Command Surgeon Headquarters Third Service Command U. S. Post Office and Court House Baltimore	Maryland Pennsylvania Virginia
Service Command Surgeon Headquarters Fourth Service Command Post Office Building Atlanta 3, Ga.	North Carolina South Carolina Georgia Florida Alabama Tennessee Mississippi
Service Command Surgeon Headquarters Fifth Service Command Fort Hayes Columbus 18, Ohio	Ohio West Virginia Indiana Kentucky
Service Command Surgeon Headquarters Sixth Service Command Civic Opera Building 20 North Wacker Drive Chicago 6	Illinois Michigan Wisconsin
Service Command Surgeon Headquarters Seventh Service Command New Federal Building Fifteenth and Dodge Streets Omaha 2	Missouri Kansas Iowa Nebraska Minnesota North Dakota South Dakota Wyoming Colorado
Service Command Surgeon Headquarters Eighth Service Command Santa Fe Building Dallas 2, Texas	Texas Oklahoma Arkansas New Mexico Louisiana
Service Command Surgeon Headquarters Ninth Service Command Fort Douglas, Utah	Washington Oregon Idaho Montana Utah Nevada California Arizona

In case of emergency treatment or hospitalization, the individual or his attending physician should notify the appropriate service command surgeon as determined by the accompanying tabulation and give the following information:

Full name.
Military rank.
Army serial number.
Military address, including organization and home station (orders in possession of military personnel will give this information).
Diagnosis.
Estimated duration of treatment and approximate date when patient's condition will permit transfer to an Army hospital if hospitalization is required.

All bills for medical treatment or hospitalization will be submitted to the appropriate service command surgeon and must show the soldier's name, rank, serial number, organization and home station.

The accompanying tabulation indicates the appropriate service command surgeon for reporting medical care of Army personnel and submitting bills for payment. For either purpose the location of the hospital or the physician rendering the care determines the appropriate service command surgeon. In some instances it will be necessary for the service command surgeon to forward the bills to another command for payment.

ARMY AWARDS AND COMMENDATIONS

Major General Morrison C. Stayer

Major Gen. Morrison C. Stayer, formerly of Carlisle, Pa., was recently awarded the Oak Leaf Cluster to the Distinguished Service Medal in recognition of his achievements as chief of the U. S. Army surgeon in the Mediterranean Theater of Operations. The citation accompanying the award read "for exceptionally meritorious and distinguished service in a position of great responsibility in the Mediterranean Theater of Operations during the period March 3, 1944 to May 31, 1945. Charged with safeguarding the health and lives of American troops in the battlefields of Italy and southern France and in areas notorious for the prevalence of malignant and exotic diseases, General Stayer as theater surgeon prompted the medical services under his control to achieve a record which is generally regarded as a superior standard of efficiency. Under his direct supervision many important contributions to military medicine were advanced by installations located throughout a widely dispersed area. General Stayer held to the concept that mere saving of life was not enough and that surgery and wound management demanded complete recovery without disability or disfigurement, requiring the fullest utilization of highly developed methods and technics. His brilliant professional attainments, untiring energy and devotion to the welfare of the officers and men of the Army of the United States are in keeping with the highest traditions of the military service." Dr. Stayer graduated from Jefferson Medical College of Philadelphia in 1906 and was commissioned in the regular Army in 1908.

Captain Lawrence J. Caruso

Six military awards and citations have been awarded to Capt. Lawrence J. Caruso, formerly of Brooklyn. The Silver Star was awarded to him for gallantry in action against the enemy in the vicinity of St. Laurent-sur-Mer, Normandy. He voluntarily remained under intense enemy fire administering first aid and directing the evacuation of casualties. He assisted in the removal of injured soldiers from mine fields and succeeded in removing them to safety despite his own injuries, for which he was awarded the Purple Heart.

In August 1944 he received an Oak Leaf Cluster to his Silver Star by courageously entering an area receiving severe bombardment by enemy aircraft, administering first aid and directing the evacuation of casualties.

The Bronze Star was awarded to him for meritorious achievement in connection with military operations in the summer of 1944.

A Certificate of Merit was awarded in March 1945 for heroism in entering a burning building and extinguishing a fire which was threatening his men as well as the destruction of a large quantity of medical supplies.

He was recently awarded a second Oak Leaf Cluster for other meritorious service.

Dr. Caruso graduated from the Long Island College of Medicine, Brooklyn, in 1940 and entered the service June 20, 1942.

Captain Robert E. Vorisek

Capt. Robert E. Vorisek, formerly of New York, was recently awarded the Silver Star for gallantry in action at Colasion Point, Leyte. It is reported that with magnificent courage and determination Captain Vorisek exposed himself to flying shell fragments to administer medical attention to a number of casualties during intense enemy artillery shelling. When the order was given to evacuate the area, Captain Vorisek remained until all casualties had been treated and removed to a safer area. Dr. Vorisek graduated from the Long Island College of Medicine, Brooklyn, in 1941 and entered the service Dec. 30, 1942.

NAVY

INTERNSHIPS AND NAVY V-12 MEDICAL SCHOOL GRADUATES

Navy V-12 Bulletin 317, issued by the Bureau of Naval Personnel, describes the procedures currently in effect regarding internships for Navy V-12 medical students.

Students may elect to apply for internships either in naval hospitals (if 21 years of age or over) or in civilian institutions. In either case they will be appointed to the rank of Lieutenant (junior grade) MC or MC(S), U. S. Naval Reserve.

Students desiring assignment to a naval hospital should make application to the Bureau of Medicine and Surgery via their commanding officers after completion of their junior year. Candidates will receive official notification via their commanding officers as to their acceptance approximately six weeks from the date of receipt of application. In any case applications must be made at least sixty days prior to graduation. Commissions as well as active duty orders to a naval hospital will be transmitted to the student through his commanding officer on graduation.

Graduates who are not given time to take state board examinations prior to reporting for active duty at a naval hospital will, at the appropriate time after reporting, submit a request to the commanding officer for such leave as may be necessary to participate.

In view of the acute shortage of medical officers in the Navy and the Naval Reserve, it is the desire of the Bureau of Medicine and Surgery that every effort be made to encourage V-12 medical students to apply for intern training in naval hospitals.

Students electing to serve civilian internships or not selected for naval internships are advised to make every effort to contract for rotating internships, to commence within thirty days of graduation.

At least sixty days before graduation date the commanding officers of Navy V-12 units at medical schools submit lists of senior V-12 medical students scheduled to graduate indicating applicants who have been selected for intern training in naval hospitals and those who are committed to civilian internships.

LIFE SAVING FACILITIES IN PACIFIC

Rear Admiral Richard H. Laning (MC), U.S.N., inspector of Medical Department Activities, Pacific Ocean Areas, recently reported to Rear Admiral William J. C. Agnew (MC), U.S.N., acting chief of the Bureau of Medicine and Surgery, Washington, D. C., that the life saving facilities in the Pacific are at their peak in preparation for developments against the enemy. Boding well for future naval and amphibious operations, said Rear Admiral Laning, are improvements made in air evacuation of casualties, shipment by air of whole blood, deployment of newly added hospital ships, construction of additional fleet and base hospitals in forward areas and gains which have been achieved in prevention and control of communicable diseases.

NEW OCCUPATIONAL THERAPY BUILDING

A new occupational therapy building was recently opened at the National Naval Medical Center, Bethesda, Md., with a daily capacity of 300 patients in the fourteen workshops. A staff of 15 is under the direction of Lieut. (jg) M. S. Vetting (W) U.S.N.R., with Lieut. Comdr. H. S. Etter (MC), U.S.N.R., having general supervision. Dr. Etter is rehabilitation officer of the Naval Hospital.

COMMANDS UNITED STATES NAVAL HOSPITAL AT ST. ALBANS

Capt. Edwin D. McMorries (MC), U.S.N., recently took command of the United States Naval Hospital at St. Albans, Queens, L. I., N. Y. Capt. Lester L. Pratt (MC), U.S.N., who had been medical officer in command of the hospital since its inception in February 1943, will leave to become district medical officer of the Thirteenth Naval District, with headquarters in Seattle.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Henrik W. Szylejko

The Navy and Marine Corps Medal was recently awarded to Lieut. Henrik W. Szylejko, formerly of Philadelphia. The citation read "For heroism while serving as senior medical officer of the United States Landing Ship Tank 496 during the invasion of France from June 6, 1944 to June 13, 1944. When his ship was damaged by enemy action on the night of the 11th of June Lieutenant (jg) Szylejko was knocked unconscious by the terrific concussion. On regaining consciousness he carried the unconscious form of a fellow officer to a stretcher in the passageway leading topside and went to his battle station in the crews' quarters. After giving first aid to the living, he proceeded to the conn, where besides others he found the dead bodies of the captain and the executive officer. He gave first aid to an army doctor who had collapsed as a result of a broken back. He then proceeded to inspect the ship to ascertain the damage and to distinguish the living from the dead. He dragged one man topside during this tour. After making certain that everything had been checked, he gave the order to abandon ship. After the ship had been abandoned Lieutenant (jg) Szylejko boarded the rescue ship to which the more seriously injured had been removed and undertook to render medical aid to 11 unconscious men topside. He continued his efforts on board this ship and aboard a hospital ship to which he was later transferred until the pain in his chest became too terrible and he began to spit blood. The courage, professional skill and leadership displayed on this occasion were in keeping with the best traditions of the United States Naval Service." Dr. Szylejko graduated from Georgetown University School of Medicine, Washington, D. C., in 1943 and entered the service Jan. 10, 1944.

Lieutenant Charles Woodrow Styron

The Bronze Star was recently awarded to Lieut. Charles Woodrow Styron, formerly of Boston, "for heroic achievement as medical officer of an assault battalion during operations on Saipan, Marianas Islands, from June 15 to July 10, 1944. Although repeatedly in such close proximity to the enemy that mortar fire fell on his aid station and sniper fire killed persons in his vicinity, Lieutenant Styron carried on steadfastly in his ministrations to the wounded. On one occasion during heavy Japanese fire he continued to operate his station in a forward position while the remainder of the command post personnel fell back to a safer position. By his cool and capable direction of activities he was responsible for the efficient functioning of all medical personnel attached to the battalion despite the most difficult combat conditions. His gallant conduct throughout this period was in keeping with the highest traditions of the United States Naval Service." Dr. Styron graduated from Duke University School of Medicine, Durham, N. C., in 1938 and entered the service July 1, 1942.

Lieutenant Commander John Winston Fish

Lieut. Comdr. John Winston Fish, formerly of Louisville, Ky., was posthumously awarded the Bronze Star, according to the citation, "for heroic achievement while serving as flight surgeon of Air Group Eighteen, attached to the U. S. S. *Intrepid*, during air operations against enemy Japanese installations, aircraft and surface vessels in the Philippine Islands Area from Oct. 10 to Nov. 6, 1944. A skilled and courageous surgeon, Lieutenant Commander Fish continuously performed his duties under extremely hazardous conditions and made recommendations which aided materially in maintaining the Air Group's morale and physical well-being over an extended period of intensive operations. On October 29, while under intense fire from an enemy attack, he was the first to administer medical aid to the wounded and, by his quick and effective action, saved several lives that otherwise would have been lost. His heroism and unfailing good humor were an inspiration to the crew and his gallant conduct was in keeping with the highest traditions of the United States Naval Service." Dr. Fish graduated from the University of Louisville School of Medicine in 1934 and entered the service March 21, 1942.

VETERANS

WAR MANPOWER COMMISSION TO URGE ENROLMENT OF VETERANS IN MEDICAL SCHOOLS

On August 21 Mr. Paul V. McNutt, director of the War Manpower Commission, issued a release indicating that the War Manpower Commission, cooperating with the Army and Navy, will endeavor to enroll 12,000 students for the medical and dental schools of the United States this fall from among the veterans who are now available for release from the armed forces.

Of this number 8,000 are for medical schools and 4,000 for dental schools, the veterans being entitled to support for their education under the G. I. Bill of Rights. In his release Mr. McNutt stated that the Army would require permanently 10,000 physicians, the Navy 5,000 physicians and the Veterans Administration 15,000 physicians and that additional physicians would be needed for service abroad.

Mr. McNutt also estimated that the overall deficiency in the United States during the postwar period would amount to 35,000 physicians.

PERMANENT ESTABLISHMENTS FOR RESTORATION OF INJURED VETERANS

Soldiers' memorials in the form of permanent establishments for the restoration of injured veterans, rather than stone and bronze monuments, is the aim of the Baruch Committee on Physical Medicine. Founded in 1944 by Bernard M. Baruch with an endowment of $1,190,000, the committee had for its purpose the development of physical medicine. The subcommittee on war and postwar physical rehabilitation and reconditioning, made up almost entirely of medical corps officers of the armed services, has sent out a blueprint of an ideal war memorial. After erection of treatment centers, and as time goes on, civilian patients, especially those injured in modern industry, may be sent to the centers by their physicians or surgeons, their care helping to meet expenses. Returned veterans may be placed in centers close to their homes. So situated they will not feel neglected and forgotten but, on the contrary, would be provided for under circumstances arranged and assembled for their rehabilitation with the sole aim of restoring them to normal life and useful activity.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Dibble General Hospital, Menlo Park: Diagnosis and Treatment of Arthritis, Dr. Stacy R. Mettier, September 3; Nephritis, Dr. Leslie L. Bennett, September 3.

DeWitt General Hospital, Auburn:

SEPTEMBER 14 (AFTERNOON SESSION)

1. Care of Paraplegic Patients:
   a. Neurologic Lesions and Considerations, Dr. Howard Naffziger.
   b. Immediate Care of Spinal Cord Injuries, Capt. Rudolph Ziegler.
   c. Treatment of Decubitus Ulcers, Major Harry Benteen.
   d. Methods of Locomotion and Conditioning, Lieut. Jack Gregory.
   e. Program of Ambulation at DeWitt General Hospital, Lieut. Elwyn Shonyo.
   f. Urologic Care, Major D. C. Malcolm.
   g. Occupational and Vocational Rehabilitation, Lieut. Col. Ambrose Storck.
2. The Arthritides and Therapy, Dr. S. R. Mettier.
   a. Surgical Reconstruction, Capt. Fred Rhinelander.
3. Peptic Ulcer Symposium:
   a. Diagnosis and Medical Regimen, Major J. J. Kane.
   b. Amylase Test; Diagnostic Aid in Abdominal Pain, Capt. Melvin Kirstein.
   c. Roentgenologic Findings, Major Walter Scribner.
   d. Psychosomatic Considerations, Capt. Jerome Weinberger.
   e. Surgical Treatment, Dr. Alton Ochsner.

SEPTEMBER 14 (EVENING SESSION)

4. Vascular Diseases:
   a. Organization, Equipment and Function of a Vascular Center, Lieut. Col. Ambrose Storck.
   b. Classification and Medical Discussion, Capt. John Waller.
   c. Anatomic Considerations and Treatment of Varicose Veins, Dr. Stanton Sherman.
   d. Phlebography in Deep Venous Obstruction, Major Arthur Koepsell.
   e. New Method for Testing and Developing Collateral Circulation, Captain Massell.
   f. Treatment of Arteriovenous Aneurysm, Major Norman Freeman.
   g. Basic Vascular Tone in Sympathectomy, Lieut. William Rector.

SEPTEMBER 15 (AFTERNOON SESSION)

5. Surgical Treatment of Empyema, Dr. Alton Ochsner.
6. The Alcoholic Patient, Dr. Alexander Simon.
7. Outline of Care of Psychiatric Patients, Major Daniel Sullivan.
8. Pulmonary Coccidioidomycosis, Dr. Charles Smith.
9. Inguinal Hernia:
   a. Anatomic Considerations, Dr. John Saunders.
   b. Repair of Primary and Recurrent Hernia, Major Harry Benteen.
10. Orthopedic Presentations:
    a. Reconstructive Surgery of the Hand, Dr. Sterling Bunnell.
    b. Experience in Treatment of Compound Fractures, Lieut. Col. E. K. Prigge.
    c. Treatment of Severely Injured Elbow, Capt. Elbert Davis.

SEPTEMBER 15 (EVENING SESSION)

11. Neurosurgical Symposium:
    a. Diagnosis of Protruded Intervertebral Disk, Capt. Manuel Sall.
    b. Surgical Treatment and Prognosis of Protruded Intervertebral Disk, Lieut. Comdr. Keith Bradford.
    c. Correction of Cranial Defects, Major Tracy Haverfield.
    d. Peripheral Nerve Repair, Lieut. Bertram Selverstone.
    e. Management of Combined Bone and Nerve Lesions, Capt. Jerome Sweeney.
    f. Reeducation of Aphasic Patients, Lieut. Joseph Wepman.
12. Methods of Therapy in Dermatoses, Capt. Eugene Bereston.
    a. Roentgen Therapy and Cautions, Major Walter Scribner.
13. Penicillin Therapy in Chronic Sinusitis, Capt. Robert Chait.
14. Administration of Fluids, Plasma and Blood in Prolonged Surgery, Major G. C. Langsdorf.
    a. Laboratory Adjuncts in Blood Matching and Blood Bank, Lieut. Col. Irving Madoff.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, July 28, page 959)

CALIFORNIA

St. Joseph's Hospital, San Francisco. Capacity, 245; admissions, 7,327. Sister M. Raymond, Superior (interns, January 1 and April 1, 1946).

Santa Clara County Hospital, San Jose. Capacity, 453; admissions, 4,682. Dr. Henry E. Dahleen, Superintendent (resident—tuberculosis, disqualified for military service).

CONNECTICUT

Bridgeport Hospital, Bridgeport. Capacity, 416; admissions, 10,234. Mr. Oliver H. Bartine, Superintendent (interns, April 1, 1946).

ILLINOIS

Belmont Community Hospital, Chicago. Capacity, 125; admissions, 4,180. Mrs. Gertrude F. Scofield, Superintendent (interns, September 1945; January and July 1946).

MASSACHUSETTS

Memorial Hospital, Worcester. Capacity, 215; admissions, 7,713. Dr. Winthrop B. Osgood, Superintendent (3 interns).

NEW YORK

Auburn City Hospital, Auburn. Capacity, 255; admissions, 6,198. Mr. Jerome F. Peck Jr., Acting Superintendent (resident—mixed service).

Coney Island Hospital, Brooklyn. Capacity, 300; admissions, 5,519. Dr. Saul M. Penner, Superintendent (6 interns).

Israel Zion Hospital, Brooklyn. Capacity, 518; admissions, 9,867. Dr. J. Prager, Executive Director (interns, October 1, 1945; April 1, 1946).

PENNSYLVANIA

Western State Psychiatric Institute and Clinic, Pittsburgh. Capacity, 136; admissions, 104. Dr. Grosvenor B. Pearson, Director (12 residents—psychiatry, including 10 disqualified for military service).

UTAH

St. Mark's Hospital, Salt Lake City. Capacity, 238; admissions, 4,838. Mrs. Olive V. Wardrop, Superintendent (intern, October 1).

Thomas D. Dee Memorial Hospital, Ogden. Capacity, 400; admissions, 8,405. Mr. L. H. Evans, Superintendent (interns).

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Jacob C. Geiger, director of public health of the city and county of San Francisco, was recently awarded the decoration of the Orden de Vasco-Nunez de Balboa, grade of Knight Commander, for services to Panama.

Alameda County Society Begins Monthly Bulletin.—With the August issue the *Bulletin of the Alameda County Medical Association* made its appearance. The cover shows the Oakland bridge, and the contents discuss the proposed activities of the association under a recently inaugurated "accelerated program." Dr. Milton H. Shutes is the editor.

FLORIDA

Election of State Medical Board.—Dr. Joseph B. Kollar, Vero Beach, was elected president of the Florida State Board of Medical Examiners at a meeting in Jacksonville June 25, succeeding Dr. Howard G. Holland, Leesburg. Dr. Frank D. Gray, Orlando, was named vice president and Dr. Harold D. Van Schaick, Miami, was reelected secretary-treasurer.

GEORGIA

Personal.—Mrs. Stewart R. Roberts has been appointed assistant secretary of the Fulton County Medical Society, effective July 1.

Edwin Watson Resigns.—Dr. Edwin R. Watson has resigned as director of the division of maternal and child health of the Georgia State Department of Public Health to enter private practice in Macon. He has been connected with the state department for eight years. Dr. Guy G. Lunsford, director of local health organizations, will serve as acting director of the maternal and child health division, according to *Georgia's Health*.

Rabies Control Supervisor Named.—Leland Edson Starr, Ph.D., formerly assistant dean of the school of veterinary medicine and professor of pathology, Alabama Polytechnic Institute, and recently in private practice of veterinary medicine in Roanoke, Va., has been appointed state rabies control supervisor with the Georgia Department of Public Health, effective July 12. Dr. Starr will assist counties in setting up local organizations for rabies control, in accordance with the new rabies control law which requires vaccination of all dogs, according to *Georgia's Health*.

ILLINOIS

Personal.—Dr. Sandor Horwitz, Peoria, recently completed fifty years in the practice of medicine.—Dr. and Mrs. Edward A. Elfeld, Arlington Heights, recently celebrated their fiftieth wedding anniversary.

Sixteen Deaths from Poliomyelitis.—An outbreak of infantile paralysis in Rockford and surrounding area has been responsible for 140 cases and sixteen deaths since July 1, newspapers report. Rockford reported 71 cases, Winnebago County 61 and Stephenson, Boone and Carroll counties 8.

Chicago

Appointments in Pharmacology at Illinois.—Dr. Carl C. Pfeiffer has been appointed professor and head of the department of pharmacology, materia medica and therapeutics at the University of Illinois College of Medicine, effective on his release from the U. S. Navy, August 15. Dr. Pfeiffer graduated at the University of Chicago School of Medicine in 1937. He was pharmacologist with Parke, Davis & Co. from 1941 to 1943, when he entered the Navy. Earl Randall Loew, Ph.D., research pharmacologist with Parke, Davis & Co., has been named associate professor of pharmacology, materia medica and therapeutics, and Dr. Klaus R. W. Unna, formerly research associate with the Merck Institute of Therapeutic Research, Rahway, N. J., and recently instructor in pharmacology, University of Pennsylvania School of Medicine, Philadelphia, has been named assistant professor in the department of pharmacology at Illinois.

INDIANA

George Clowes Retires.—George Henry Alexander Clowes, Ph.D., since 1920 director of the research laboratories of Eli Lilly and Company, Indianapolis, has retired.

State Meeting Canceled.—The 1945 annual session of the Indiana State Medical Association, which was scheduled for French Lick Springs, October 2-4, has been canceled. The regular annual meeting of the house of delegates will be held sometime in the future at Indianapolis on the call of the president.

Physician Receives Service Award.—Dr. Harold P. Graessle, Seymour, was recently presented with the first annual "Seymour Distinguished Service Award" to be sponsored annually by the Seymour Rotary Club. The recipient of the award can be any citizen of the Seymour area who has rendered a service during the previous eighteen months that will have a lasting influence on the life in Seymour, it was stated.

MAINE

Reappointments to Medical Board.—Governor Horace A. Hildreth on July 11 reappointed Dr. Adam P. Leighton, Portland, and Dr. Currier C. Weymouth, Farmington, as members of the Maine Board of Registration of Medicine. Dr. Leighton, with his reappointment, began his thirty-first year as member and secretary of the board.

MARYLAND

Communicable Disease Control Ordinance Enacted.—An ordinance has been enacted by the city council of Baltimore to strengthen the program of the city health department to prevent communicable diseases in Baltimore. The ordinance authorized the commissioner of health to make and adopt rules and regulations to prevent and control the spread of communicable diseases and to provide punishment for any violations.

Southern Health District.—The city council has recently enacted an ordinance providing for the acquisition of land and construction thereon of a health center in south Baltimore to be known as the Southern Health District Building. While the Eastern Health District was established in 1932, the Western Health District in 1935, the Southeastern Health District in 1937 and the Druid Health Center in 1939, the new Southern Health District edifice will be the first building excepting Sydenham Hospital ever to be erected in Baltimore expressly for the use of the city health department. The commissioners of finance of the city are empowered to issue certificates of indebtedness to an amount not exceeding two million dollars to finance the project.

Rodent Control Study.—John T. Emlen Jr., Ph.D., Davis, Calif., has been appointed research associate in the department of parasitology of the Johns Hopkins School of Hygiene and Public Health to take charge of investigations on rodent ecology and control, according to *Science*. The program, supported by a grant from the Rockefeller Foundation, is being carried out with the cooperation of the rodent control division of the city of Baltimore. It is a continuation and expansion of the field studies which Curt P. Richter, Ph.D., of the Johns Hopkins University School of Medicine developed during the last three years in cooperation with this division. Dr. Richter will serve on the advisory committee for this expanded program and is continuing his laboratory investigations on the behavior of wild rats as part of the new program.

MICHIGAN

State Meeting Canceled.—The proposed 1945 annual session of the Michigan State Medical Society has been canceled.

Changes in Health Officers.—Dr. Joseph A. Murphy was recently appointed health officer of Whitehall. Dr. Albert E. Heustis Jr. has been named director of Branch County with headquarters in Coldwater, succeeding Dr. Ira O. Church, who resigned to go to California (THE JOURNAL, July 7, p. 742). Dr. John J. Angel has been appointed village health officer of Wayne.

Personal.—Dr. Thomas E. DeGurse, Marine City, was recently guest of honor at a dinner in recognition of his completion of fifty years in the practice of medicine. He was presented with a leather portfolio, and speakers at the dinner included Drs. Andrew S. Brunk, Detroit, L. Fernald Foster, Bay City, president and secretary respectively of the Michigan State Medical Society, Oscar D. Stryker, Fremont, Clarence E. Umphrey and Eldwin R. Witwer, Detroit, councilors of the state society, and William J. Burns, LL.B., Lansing, executive secretary of the society. Dr. DeGurse has served

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as councilor of the state medical society and president of the St. Clair County Medical Society. —— Arthur D. Emmett, Ph.D., assistant director of research with Parke, Davis & Company, Detroit, retired July 1 to become consultant. Dr. Emmett has been in charge of the vitamin division for twenty-nine years.

Clinical Teaching in Internal Medicine.—The department of postgraduate medicine of the University of Michigan Medical School, Ann Arbor, has arranged a clinical teaching program for every Thursday afternoon beginning September 13 and continuing through December 20 at the University Hospital. The program is designed to serve the needs of practicing physicians who are interested in problems of internal medicine. It will consist of clinical discussion on ward rounds conducted each day by two different members of the senior staff of the department of internal medicine and will end with a conference of the entire medical staff and review of recent interesting electrocardiograms.

MINNESOTA

Illegal Practitioner.—On July 6 Mrs. Florence M. Johnson, Minneapolis, was sentenced by Judge Frank E. Reed of the district court to a term of one year in the Hennepin County Jail following her plea of guilty to a charge of practicing massage without a license. The sentence was stayed for one year on condition that the defendant close her office, dispose of her equipment and absolutely refrain from the practice of healing or massage in any manner in the future. In investigation the state board of medical examiners showed that Mrs. Johnson had opened an office in the Medical Block, Minneapolis, in April 1945 and that she had in her possession a certificate dated June 24, 1940, which she had obtained from the Minnesota Clinical Institute, Minneapolis. The certificate was signed by John LeMay, president, and Dr. Cornelius W. Wall. The physician died in January 1944 and LeMay was under arrest on July 13 charged with practicing healing without a basic science certificate. Mrs. Johnson was operating a massage and bath parlor under the name of Fredjohn Health Center, charging $3 for her treatments.

MISSISSIPPI

Personal.—Dr. Rosier D. Dedwylder, Cleveland, on July 1 completed twenty-five years' service as director of the Bolivar County Health Department.

Medical Society Votes Against Four Year Medical School.—The Lauderdale County Medical Society, in special session July 12, adopted resolutions to the effect that the establishment of a four year medical school is not the answer to supplying an adequate number of doctors for rural citizens of Mississippi, according to the Jackson *News*. It was stated further that "the time is not propitious for establishing a four year school of medicine in Mississippi."

MISSOURI

Special Society Election.—Dr. Richard G. Helman, Kansas City, was recently elected president of the Kansas City Obstetrical and Gynecological Society. Other officers include Drs. Russell D. Etzenhouser, Independence, vice president, and John O. Kennedy, Kansas City, secretary-treasurer.

Health Lectures.—The Jackson County Health Forum will open its 1945-1946 lecture series on September 19 with a talk by Dr. Robert M. Stecher, Cleveland, on "Arthritis and Gout." "Medical Care for the American People" will be the theme of a symposium on October 17 with Senator Claude Pepper, Washington, D. C., and Dr. Louis H. Bauer, Hempstead, N. Y., Trustee of the American Medical Association, as speakers and with Dr. Morris Fishbein, Editor of THE JOURNAL, as moderator and interlocutor. Other lecturers in the series will be:

Dr. Irvine H. Page, Cleveland, November 21, High Blood Pressure and Your Kidneys.
Dr. Henry H. Turner, Oklahoma City, January 16, Your Glands Your Dynamo.
Dr. Walter H. Theobald, Chicago, February 20, Sinus and Colds.
Dr. Derrick T. Vail, Cincinnati, March 20, Save Your Eyesight.
Dr. Fishbein, April 17, Diet and Health.

OHIO

Legislation Concerning Health.—Recently enacted legislation, effective September 28, limits the use of the Ohio State Sanatorium, Mount Vernon, to the care and treatment of the mentally ill, mentally deficient and epileptic patients suffering from tuberculosis. Another bill appropriates $1,190,000 to the welfare department for construction and equipment at the sanatorium. A bill, effective September 21, makes definite that a child of school age afflicted with tuberculosis is included in the state educational program and sets at rest the question of responsibility for the education of the child.

New Department of Clinical Biochemistry.—Victor C. Myers, Ph.D., professor and head of the department of biochemistry, Western Reserve University School of Medicine, Cleveland, has been named director of a newly created department of clinical biochemistry at the school. The present department of biochemistry will be enlarged and a new director selected.

Appointment in Hearing and Speech Therapy.—Warren H. Gardner, Ph.D., San Mateo, Calif., has been appointed professor of hearing and speech therapy at Western Reserve University School of Medicine and director of clinical services of the Cleveland Hearing and Speech Center, according to the Cleveland *Press* of July 6. The appointment will be effective September 1. Dr. Gardner has been associated with the California state department of public health and has been conducting tests on school children of the state. The Cleveland Hearing and Speech Center recently was formed by the Cleveland Hearing Center and Speech Clinic at Western Reserve University (THE JOURNAL, June 9, p. 453).

Industrial Accidents.—The Ohio Industrial Commission recently reported that, of the 328,121 claims filed during 1943, 1,104 were for fatalities, 8 for permanent total disability, 2,797 for permanent partial disability, 46,604 for temporary disability over seven days, 25,860 for temporary disability of seven days or less and 251,748 for temporary disability which resulted in no time loss. The days lost through disabilities totaled 10,106,407. In 1943 the six principal agencies causing industrial accidents in the order of their standing were machinery 72,601 claims with 44 fatalities, hand tools 34,283 with 13 fatalities, metal stock (not otherwise listed) 34,487 with 11 fatalities, bundles, barrels, boxes, benches and the like 21,707 with 18 fatalities, flying objects, dust, cinders and the like 16,433 with no fatalities and pipes, rods, sheets or plates 17,173 with 12 fatalities.

PENNSYLVANIA

$100,000 for Cancer Research.—The Pennsylvania State Department of Health will receive $100,000 or what part of the sum may be needed to conduct cancer research to determine the cause, mortality rate, methods of treatment, prevention and cure of cancer and allied diseases, including the nature and extent of the facilities available in the counties and cities of the state for the diagnosis and treatment of these diseases. The appropriation was provided for in a bill recently signed by Gov. Edward Martin, according to the *Field Army News*.

Philadelphia

Lester Burket Named Professor of Oral Medicine.—Dr. Lester W. Burket, assistant professor, has been appointed professor and head of the department of oral medicine at the University of Pennsylvania Dental School.

George W. Raiziss Dies.—George W. Raiziss, Ph.D., head of the department of chemistry of the Dermatological Research Laboratories and later director of that organization on its merger with Abbott Laboratories, died July 16 in the Atlantic City Hospital, Atlantic City, N. J.

Pittsburgh

Course in Clinical Allergy.—The University of Pittsburgh School of Medicine announces an orientation course in clinical allergy, October 1-5, under the auspices of the American Academy of Allergy. The course will include lectures, demonstrations, case presentations and laboratory procedures covering all aspects of allergy. Round table discussions will be held in the evening. Allergists and internists from various parts of the country will make up the teaching faculty. Additional information may be obtained from Dr. William S. McEllroy, dean of the University of Pittsburgh School of Medicine.

SOUTH CAROLINA

Physician Wins Service Award.—Dr. Warren H. Burgess has been awarded the A. T. Heath Award for public service to the people of Sumter. The award, given annually by representatives of the city's four service clubs, consists of a silver service. Dr. Burgess has been practicing in Sumter since 1911 and has been city physician since 1914. He graduated at the Medical College of South Carolina, Charleston, in 1910.

Medical College Appointments.—Dr. John A. Boone, assistant professor of medicine, has been appointed assistant dean at the Medical College of the State of South Carolina, Charleston. Other changes noted in the Charleston *Evening Post*, June 16, included the election of Dr. Charles Frederick Williams as professor emeritus of psychiatry and the appointment of Dr. Coyt Ham as clinical professor of psychiatry. A reorganization of the neuropsychiatric department of the medical college also was announced. Dr. Douglas B. Remsen, assistant professor of medicine, is reported to have indicated that he would give up his private practice and serve as acting head of the reorganized department.

TENNESSEE

Ninety-Two Years of Age.—Dr. Henry C. Martin, Cookeville, on July 10 observed his ninety-second birthday. Dr. Martin graduated at Vanderbilt University School of Medicine, Nashville, in 1894.

Examining Board Election.—Dr. James H. Keeling, Knoxville, was elected president of the Tennessee State Board of Medical Examiners at its annual meeting in Nashville July 10, succeeding the late Dr. James K. P. Blackburn, Pulaski. Other officers include Drs. Thomas B. Yancey, Kingsport, vice president, and Harley W. Qualls, Memphis, secretary.

Personal.—Dr. William W. Frye, professor and head of the department of preventive medicine and public health, Vanderbilt University School of Medicine, Nashville, has been granted a six months leave of absence to serve on a special commission sent to China by the UNRRA to study the current cholera epidemic there, it is reported. During Dr. Frye's absence Dr. Alvin E. Keller will be acting head of the department of preventive medicine and public health.——Dr. Louis Levy, Memphis, was reelected president of the Memphis Symphony Society, Inc., June 19.

Changes in University Faculty.—Dr. Frank E. Whitacre has been promoted from associate professor to professor of obstetrics and gynecology and head of the division at the University of Tennessee College of Medicine, Memphis. Dr. William T. Pride, who is relieved as head of the division, will continue as professor. Dr. Whitacre, who from 1939 to 1941 was professor of obstetrics and gynecology and head of the department, Peiping Union Medical College, Peiping, China, was for two years interned in Manila by the Japanese. He has been connected with the university since January. Dr. James R. Reinberger has been promoted to professor of obstetrics and gynecology. Hugo M. Krueger, Ph.D., St. Louis, associate professor of pharmacology, St. Louis University School of Medicine, has been appointed assistant professor of pharmacology. Dr. Isadore N. Dubin, instructor and associate in pathology, Duke University School of Medicine, Durham, N. C., has been appointed assistant professor of pathology and bacteriology.

UTAH

Activities at Utah Medical School.—The Utah Medical Foundation has been established and incorporated at the University of Utah School of Medicine with a gift of $2,850 by the first graduating class of the four year school. The objective is to promote the cooperation of alumni and friends of the medical school in improving the undergraduate, graduate and research functions and to establish scholarships, lectureships, professorships, research and student loan funds. One of the first activities of the foundation was the establishment of the "Dr. W. R. Tyndale Lectureship in Medicine," honoring Dr. William R. Tyndale, a member of the staff of the Utah school since 1912. Dr. George W. Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, was the first speaker under the lectureship recently, discussing "The Role of Endocrine Glands in Adaptation" and "Fatigue of Thyroid and Adrenal." The U. S. Public Health Service has given a grant of $92,000 to the medical school for research in muscular dystrophy and related degenerative disorders. Dr. Maxwell M. Wintrobe, professor of medicine, is director of the study, to which an advisory committee of nationally known scientists will be appointed. The Church of Jesus Christ of Latter-Day-Saints has given the medical school $25,000 for rehabilitation, modernization and purchase of supplies and equipment for the department of pharmacology and physiology. New appointments include those of Horace W. Davenport, Ph.D., formerly associate in physiology, Harvard Medical School, Boston, as professor and head of the department of physiology, and George Sayers, Ph.D., formerly research assistant in physiologic chemistry (instructor) at Yale University, New Haven, as assistant professor of pharmacology.

VIRGINIA

Portrait of Harvey Jordan.—A feature of the recent commencement of the University of Virginia Department of Medicine, Charlottesville, was the presentation by members of the graduating class of a portrait of Dr. Harvey E. Jordan, dean. The presentation was made by Dr. Frederick V. Vance Jr., Bristol, Tenn., medical class president, and the speech of acceptance was given by John Lloyd Newcomb, LL.D., president of the university.

WEST VIRGINIA

Personal.—Dr. Hu C. Myers, Philippi, and Mr. John Hart, Charleston, have been appointed by Governor Clarence W. Meadows as members of the advisory committee to the legislative interim committee created for the purpose of making a complete study of public health problems in West Virginia (THE JOURNAL, June 23, p. 606). Dr. Myers is a past president of the Hospital Association of West Virginia and represents that organization on the advisory committee. Mr. Hart, who is director of Hospital Service, Inc., and Medical Service, Inc., Charleston, represents the medical-hospital service plans operating in West Virginia. The committee now has ten members.

WISCONSIN

Director Named for Hospital Survey.—Vincent F. Otis, business administrator of the Milwaukee County Asylum for Chronic Insane, Wauwatosa, has been appointed director of the hospital and health center survey in Wisconsin which was recently authorized by the state board of health. Mr. Otis will be responsible for the organization and supervision of the collection and analysis of facts pertaining to a statewide survey and the evaluation of plans and specifications for new and improved hospital buildings and health center needs. The recently organized state hospital advisory committee has agreed that "Hospital Schedules of Information" of the Commission on Hospital Care would be used for obtaining the desired information, and the commission's Public Health Center Schedules of Information would be used to gather the information concerning available health center facilities. Dr. Gunnar Gundersen, La Crosse, president of the state board of health, is the chairman of the state hospital advisory committee. Members of the committee's executive committee include Dr. Harold M. Coon, superintendent of the State of Wisconsin General Hospital, Madison; Mr. Charles H. Crownhart, Madison, secretary of the state medical society, and Dr. Carl N. Neupert, Madison, secretary of the state board of health.

GENERAL

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended August 11 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Poliomyelitis Week Ended 8/11, 1945	Poliomyelitis Week Ended 8/12, 1944
New England States:		
Maine	12	0
New Hampshire	0	0
Vermont	2	3
Massachusetts	28	23
Rhode Island	0	1
Connecticut	11	10
Middle Atlantic States:		
New York	111	356
New Jersey	71	21
Pennsylvania	45	72
East North Central States:		
Ohio	14	57
Indiana	12	33
Illinois	73	27
Michigan	8	53
Wisconsin	6	8
West North Central States:		
Minnesota	2	24
Iowa	6	13
Missouri	5	2
North Dakota	0	2
South Dakota	0	0
Nebraska	13	4
Kansas	3	9
South Atlantic States:		
Delaware	3	9
Maryland	4	26
Dist. of Columbia	13	10
Virginia	27	35
West Virginia	0	15
North Carolina	7	60
South Carolina	13	6
Georgia	8	5
Florida	3	0
East South Central States:		
Kentucky	0	47
Tennessee	24	9
Alabama	8	6
Mississippi	3	5
West South Central States:		
Arkansas	2	2
Louisiana	2	11
Oklahoma	18	3
Texas	56	7
Mountain States:		
Montana	1	1
Idaho	0	1
Wyoming	0	0
Colorado	7	2
New Mexico	2	0
Arizona	0	3
Utah	18	2
Nevada	1	1
Pacific States:		
Washington	17	1
Oregon	2	20
California	10	11
Total	671	1016
First 32 weeks:		
1944 and 1945	3,586	5,008
Median, 1940-1944	2,272	

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LATIN AMERICA

Health Activities in Latin America.—*Nonmilitary Personnel to Receive Army Aid.*—The services and facilities of the Army medical department will be available to "non-Army personnel, their dependents and servants living at military stations in the Panama Canal Department" under a program announced in July. Dependents are classified as "wives, children, dependent husbands or other members of a family residing with War Department employees." Treatment will be furnished by army medical officers. According to an announcement, a medical officer will be permitted to call on patients in their quarters only when they are unable to walk to the dispensary. Civilian employees whose places of duty are at locations other than at the post at which they reside, who require medical attention during duty hours, may visit the station dispensary where employed. Patients requiring hospitalization will be sent to the Gorgas, Ancon, C. Z., and Margarita, C. Z., hospitals on the Pacific and Atlantic sides respectively.

Health Center Established.—A health center has been established in Iquitos, Peru, by the Servicio Cooperative Interamericano de Salud Publica. The building was made available by the former Peruvian agency known as the Supervision de Sanidad de la Montana. Beginning January 1947 the ministry of health and social welfare of Peru will be responsible for the maintenance of the health center. The health center is in connection with the policlinic that has been functioning for more than a year. Dr. Jorge Atkins is director.

FOREIGN

Tribulations of the Netherlands Red Cross.—Officials of the Netherlands Red Cross have had to wage a continuous struggle during the five years of the occupation to prevent the organization from falling under the complete domination of the Nazis. In their attempts to make the party-controlled "Winter Help" fund the sole relief agency in the country the occupation authorities placed all kinds of handicaps in the way of the Red Cross officials, according to the Netherlands Information Bureau. When it became known that the Germans would name the Dutch Nazi head of "Winter Help" secretary-general of the Red Cross, the entire staff worked night and day to remove their stocks to safe places, so that the Germans were unable to hand them over to the wehrmacht. At the same time 98 per cent of the staff resigned and the group was forced to operate clandestinely. In reprisal the Germans arrested several staff members and kept them in jail for various periods. They also confiscated all ambulances and automobiles on the pretext that they had been used to transport ammunition for the underground movement. But despite all German efforts, the staff members of the Red Cross continued their work in secret. Transport drivers who had gone into hiding to evade the German Security Police distinguished themselves on March 3 when The Hague was erroneously bombed by the Royal Air Force. The chairman of The Hague branch, Dr. Pieter Jelle Dietz, and several nurses were killed while on their way to help victims of that attack.

UNRRA Activities.—According to a recent report Lieut. Col. Virgil P. Sydenstricker, chief of the nutrition section, United Nations Relief and Rehabilitation, and Dr. Arnold P. Meiklejohn, specialist in nutrition attached to the Rockefeller Institute for Medical Research on leave to the UNRRA, were assisting in rehabilitation work in the concentration camp of Belsen.——Col. Daniel F. Wright, U. S. Public Health Service, now chief consulting engineer of the UNRRA sanitary department, Greece, is planning a project to eradicate malaria from Greece, where, it is reported, 87 per cent of the country is infected with the disease. The country will be divided into ten districts, to each of which will be assigned one physician, two sanitary engineers, nurses and the team of fifteen sanitary inspectors. It is planned to clear swamp lands through the use of DDT and to effect a cure of infected persons through the use of quinine.——Dr. Dudley A. Reekie, Minneapolis, on leave from the United States Public Health Service to work with the United Nations Relief and Rehabilitation Administration and now commanding medical officer of the UNRRA mission in Italy, reports that tuberculosis and malaria are being brought under control by projects carried forward in cooperation with the Italian government. The effect of the war has been to increase sharply the incidence of both diseases. The flooding and mining of the Anopheles breeding Pontine marshes by the Nazis during the occupation brought about renewed outbreaks of malaria; tuberculosis is being spread by returning Italian nationals who became infected in Germany. A preliminary survey to discover the incidence of malaria in the Pontine area carried out this spring at Fondi in the province of Latinia showed that 100 per cent of the population living in that section were infected. Flooding and mining of the area is slowing down the work of malaria prevention. However, for the control of the adult malaria-carrying mosquito UNRRA has shipped 45,000 square feet of window screening, which is being distributed to the people. Enough DDT oil solution to spray 1,200 houses in the most heavily mined or flooded districts has been made available. UNRRA will also provide trucks, bicycles and funds for the necessary labor of cleaning ditches and spraying chemicals. The UNRRA malaria control project is under the direction of Lieut. Col. Vincent B. Lamourex, an epidemic control engineer, who is chief consultant with the UNRRA staff in Italy. Plans are now in progress to send units of Italian engineers into other parts of the country to supervise malaria control work throughout the malaria season. This work is supplementary to the malaria programs of the military command and the Italian government.

Government Services

Regular Corps Appointments for Medical Officers in the U. S. Public Health Service

A competitive examination for appointment in the Regular Corps in grades of Assistant Surgeon (1st Lieutenant) and Senior Assistant Surgeon (Captain) will be held on the dates listed in the table.

Regular Corps appointments are permanent in nature and provide unique opportunities to qualified doctors for a life career in one or more of a large number of fields including research, general hospitals, special hospitals, foreign duty and federal, state and local public health programs. Assignments are made with all possible consideration of the officer's demonstrated abilities and experience. There is ample opportunity for professional growth and development. Examinations will be oral and written. The oral examination will be held at 9 a. m. at the several places listed on the dates shown. The written examination will be held on October 8, 9 and 10 at places convenient to the candidate and the service. Applicants for the grade of Assistant Surgeon must be citizens of the United States, must present diploma of graduation from a recognized medical school, must have had or be in process of completing an internship or its equivalent and must have a physical examination at place of oral examination by medical officers of the service. Applicants for the grade of Senior Assistant Surgeon must meet the aforementioned requirements and must have had an additional four years of training or experience. Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Bethesda Station, Washington 14, D. C.

Entrance pay for Assistant Surgeon with dependents is $3,411 a year and for Senior Assistant Surgeon with dependents is $3,991 a year. Promotions are at regular intervals up to and including the grade of Medical Director, which corresponds to full Colonel at $7,951 a year. Retirement pay at 64 is $4,500 a year. Full medical care, including disability retirement at three-fourth's pay, is provided. All expenses of official travel are paid by the government. Thirty days' annual leave with pay is provided. All commissioned officers have full military status for the duration of the present war.

Places and dates of oral examinations:

Atlanta, Ga.—Malaria Control in War Areas, 605 Volunteer Building	Sept. 13
Baltimore—Marine Hospital, Wyman Park Drive and 31st Street	Oct. 1
Boston—Marine Hospital, 77 Warren Street (Brighton)	Sept. 10
Chicago—Marine Hospital, 4141 Clarendon Avenue	Sept. 25
Cleveland—Marine Hospital, Fairhill Road and E. 124th Street	Sept. 27
Detroit—Marine Hospital, Windmill Pointe	Sept. 26
Fort Worth, Texas—U. S. Public Health Service Hospital	Sept. 15
Kansas City, Mo.—U. S. P. H. S. District No. 7, 603 B. N. A. Building	Sept. 22
Kirkwood, Mo., near St. Louis—Marine Hospital, 525 Couch Avenue	Sept. 24
Los Angeles—U. S. P. H. S. Relief Station, 406 Federal Building	Sept. 17
New Orleans—Marine Hospital, 210 State Street	Sept. 14
New York—Stapleton, Staten Island, Marine Hospital	Sept. 11
Norfolk, Va.—Marine Hospital, Hampton Boulevard-Larchmont	Sept. 12
San Francisco—Marine Hospital, 14th Avenue and Park Boulevard	Sept. 18
Seattle—Marine Hospital, Judkins Street and 14th Avenue, South	Sept. 20
Washington, D. C.—U. S. P. H. S. Dispensary, Fourth and D Streets S.W.	Oct. 2

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 31, 1945.

The Farewell of the American Medical Officers

The forces of the United States are leaving this country with, of course, their medical officers. From the European Theater of Operations Major Gen. P. R. Hawley has written to the British Medical Association expressing great regret at their departure, which breaks the happy links formed with the medical profession in Britain. He states that it is his pleasant privilege as well as his urgent duty to express to the British Medical Association the deep appreciation of the medical officers "for all the courtesies extended to them by your splendid organization." The *British Medical Journal* says that the departure of the Americans will be sincerely regretted by their British colleagues. The presence of the American medical officers has been like a refreshing breeze at the British Medical Association House, the Royal Society of Medicine and elsewhere. In clinical and scientific meetings they have thrown their experience and ideas freely into the common pool. Many permanent friendships have been made, and the cause of Anglo-American unity has been greatly advanced by this most welcome of war invasions.

New Clinic for the Investigation of Deafness and Hearing Aids

The Medical Research Council has for some years been concerned with the problems of deafness through its committee on the physiology of hearing. It has recently formed three research committees—one to deal with the medical and surgical problems of deafness, the second to consider the design and performance of electroacoustic equipment, and the third to look into the education of the deaf. The provision of a suitable deaf aid at a reasonable cost and with easy maintenance is an urgent need for those who can be so relieved. The council is opening at the National Hospital, London (the great center of British neurology), a special clinic for the investigation and treatment of all kinds of deafness except that accompanied by active otitis with ear discharge. The Otological Research Unit will be under the direction of Dr. C. S. Hallpike, aural physician to the National Hospital and a member of the scientific staff of the Medical Research Council and of its Electroacoustics Committee. The new clinic should prove most useful, for the large number of persons who now require hearing aids can obtain them only at exorbitant prices, and their maintenance is an additional burden.

Grant from Great Chemical Firm for Scientific Research in India

As previously reported in THE JOURNAL (July 29, 1944, p. 924) the physiologist Prof. A. V. Hill, F.R.S., returned from a mission to India on behalf of the Royal Society. In his report to the society he stressed the need for greater scientific cooperation of British and Indian science. In spite of brilliant achievements Indian science is too narrowly based for the demands to which it will be subjected by the immense program of national reconstruction now being worked out. Britain can lend valuable aid by facilities for Indian research workers in this country, by lending scientists to India and by establishing effective liaison between the two countries. The main work will fall on the specialists societies in India, whose work is likely to be coordinated in the future by a minister of the government. Among the Indian societies Professor Hill particularly commended the National Institute of Sciences of India as best suited to form a scientific academy comparable to the Royal Society of London. A munificent offer has been made to it.

Lord McGowan, president of Imperial Chemical Industries, has written to Professor Wadia, president of the National Institute of Science of India, offering a number of research fellowships for the encouragement of Indians in chemistry, physics and biology, to be held at Indian universities and institutions. The sum offered is $100,000 over the next five to seven years. In his letter Lord McGowan states that until recent years the Royal Society was hampered by lack of funds and provision for the maintenance of scientific workers. This difficulty was overcome by the generosity of various benefactors including industrialists such as Mond and Messel. There seemed no better way of encouraging the advance of science in India and with it the general prosperity of the country than by offering these fellowships. Each will be worth $110 a month and will be tenable in the first instance for two years with possibility of extension up to three years. In addition there will be a grant for research expenses. The fellowships will be open to persons irrespective of sex, race or religion who are under the age of 35 years.

Great Hospital of the British Army Handed Back by the Americans

Eighteen months ago the British army handed over to the United States Army in this country its historic and greatest hospital, the Royal Victoria Hospital, Netley. The ceremony was described in THE JOURNAL at the time, but for security reasons the location was not given. In another picturesque ceremony the hospital has been returned to the British army by Brig. Gen. Charles B. Spruit, United Kingdom base surgeon of the United States Army. In receiving back the hospital Sir Alexander Hood, Director General of the Army Medical Service, said "We of the British Army Medical Service would like our American friends to have a tangible token to remind them of their stay here. I therefore present to the United States Medical Services the key of the hospital. I hope it will remind them not only of Netley but also of the fact that our services, which have so long been mutually supporting one another, are for all time united." Though the main buildings of Netley have been handed back, the American Medical Services still retain a hospital within its grounds.

Rockefeller Traveling Fellowships to Be Resumed

It is announced by the Medical Research Council that preliminary arrangements have been made for the resumption of the Rockefeller Medical Fellowships. These are provided from a fund entrusted to the council by the Rockefeller Foundation of New York. The fellowships are intended for graduates resident in Britain who have had some training in research work in clinical medicine or surgery or some other branch of medical science and who are likely to profit by a period of work at a center in the United States or elsewhere abroad before taking up positions for higher teaching or research in Britain. It is hoped to make a limited number of awards during the academic year 1945-1946, depending on the availability of candidates and the facilities for travel.

Munificent Grant by Wellcome Trustees for Rebuilding of Royal College of Surgeons

The late Sir Henry Wellcome of the firm known all over the world as Burroughs Wellcome & Co. was a great philanthropist who devoted his wealth to the endowment of research. He settled in England and in 1923 resolved to consolidate his many interests in this country, America and elsewhere—research laboratories, medical museums and libraries, development and manufacturing laboratories, distributing companies and organizations. For this purpose he formed the Wellcome Foundation. He died in 1936 at the age of 82 and left a will unique among

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testamentary documents. All the shares in the foundation were vested in five trustees, whose aim he laid down to be "the advancing of research work bearing upon medicine, surgery, chemistry, physiology, bacteriology, therapeutics, materia medica, pharmacy and allied subjects." During his life he founded in London the Wellcome Laboratories of Tropical Medicine, the Wellcome Historical Medical Museum and Library and the Wellcome Museum of Medical Science, as well as other laboratories. He empowered his trustees to make grants for the foundation and extension of museums. They have granted $400,000 for the construction of three new museum floors at the Royal College of Surgeons on condition, according to the terms of the trust, that the name "Wellcome" is associated with the extension. The council of the college gratefully received the offer and decided to name one of the new buildings the "Sir Henry Wellcome Wing." The damage done to the college by German bombs has been described in previous letters to THE JOURNAL.

Legal Decision that an Antivivisection Society Is Not a Charity

The National Anti-Vivisection Society claimed exemption from income tax on the ground that it was a body established for charitable purposes only. Mr. Justice Macnaghten has decided to the contrary, as the main object of the society was the total abolition of vivisection, and it had been proved that, if experiments on living animals was discontinued, it would constitute a serious obstacle to obtaining further medical knowledge of benefit to the public.

BOLIVIA

(From Our Regular Correspondent)

LA PAZ, July 31, 1945.

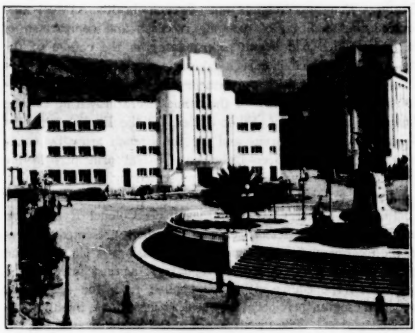
American Health Mission to Bolivia

The United States, through the Institute of Inter-American Affairs and its three divisions of Health and Sanitation, Food Supply and Training, offered to all Latin American republics its aid in furthering their health. In June 1942 Dr. Eugene H. Payne was sent by the institute to Bolivia to study existing health conditions and to furnish plans for their improvement. Dr. Payne visited the tropical regions of Santa Cruz, Beni and Pando, where the Bolivian high quality rubber is being produced and where malaria, ancylostomiasis and intestinal infections make any work hard. He studied the needs for medical care in the tin and tungsten ore mines situated high in the Andes as well as in the different towns. He presented an extensive health and sanitation report. The United States and the Bolivian government, through its Ministry of Labor, Health and Social Welfare, agreed on a two years cooperative program. A new, common organization was created under the name of "Servicio Cooperativo Interamericano de Salud Pública" under the direct supervision of the Bolivian minister of health. The program, to be completed by December 1944, included construction of two hospitals in the northern part of the country in the center of rubber production, construction and operation of some ten smaller dispensaries in the adjacent districts, construction of a leprosarium, establishment of several health centers, a central laboratory at Cochabamba, a nursing school and four sanitary launches. An educational program for the public as well as for physicians had to be started.

Dr. Payne was appointed chief of the new organization. In 1942 construction of two hospitals with a capacity of 24 beds was initiated in Riberalta and Guayaramerin, with modern equipment including x-ray units and electric light plants as well as the building of a central laboratory to be situated next to the public hospital in Cochabamba, the second largest city in Bolivia.

In 1943 Dr. George C. Gergman of Los Angeles succeeded Dr. Payne as chief. The organization headquarters were moved from Cochabamba to La Paz for a closer contact with the different government authorities. Temporary dispensaries were started in Guayaramerin, Riberalta and Magdalena to cooperate with the Rubber Development Corporation, another agency of the government of the United States, which was anxious to preserve the health of the syringueros (rubber tappers). Dr. Charles von Pohle of the Medical Corps of the United States Army was appointed chief of the medical section.

A new agreement was reached between Bolivia and the United States in January of this year extending participation of the American health mission to December 1947. In April 1945, when Dr. Bergman left for Washington, D. C., A. E. Williamson took charge of the Servicio. The actual chief of the medical department is Dr. Donald H. Eckles of the Public Health Service of Pennsylvania. Among the health projects initiated were a health center in La Paz with a well baby and sick baby clinic, an antepartum and venereal disease dispensary and a tuberculosis survey department, which is still operating without x-ray units. These departments are operated on a part time basis. In the city of Cochabamba a general dispensary



Building of the health department at La Paz, Bolivia. In the same building is also a health center and the headquarters of the Institute of Inter-American Affairs.

with two physicians in charge has been operating for over a year; the building for the central laboratory was finished last year. In Guayaramerin and in Riberalta there are still the temporary hospitals and dispensaries, each in charge of a Bolivian physician. There are some four pharmacist's mates (practicante) stationed at different points, which were selected by the Rubber Development Corporation. A small malaria control group, led by Lieut. Saul Blatman of the U. S. Army, started working in May on a quick survey in Tarija in the southern part of the country and is stationed at Guayaramerin. Free vaccination against smallpox, typhus, typhoid and whooping cough are available at the health center and at the dispensaries.

Projects are under way to provide several towns with a safe drinking water supply and with sewage disposal systems, as well as the installation of x-ray units.

The administrative department has been organized and is under supervision of several American experts. There is also a public relations department, which offers once a week a short talk over a local broadcast station.

Health education was taken over by another agency of the United States government, the Committee of Coordination, which operates independently of the Servicio; interesting movies are shown to physicians and laymen.

The training division of the institute cooperates by granting several fellowships covering such subjects as medical sciences, nursing and sanitary engineering. Some holders of fellowships are already back from study in the United States and are forming the nucleus for the training of others in this country.

Medical service has been provided to people engaged directly in the war effort, promoting health and efficiency of rubber tappers and cinchona bark workers; this is an emergency work of a temporary nature. Other projects for a long term disease control, including hospital construction and malaria survey, are quite promising. To achieve all purposes, actual health work is indeed important, but mutual understanding through personal friendships is essential too, an experience every foreigner who resides for a time in the South has had to learn.

PARIS

(From Our Regular Correspondent)

June 30, 1945.

Interallied Surgical Conferences

The first interallied surgical conference, held on April 30 at the Val de Grace, reunited representatives of the American, English, Russian, Belgian and French health services and revived the tradition of common research and comparison of methods, which had begun so profitably in the course of the last war and which had been taken up again in 1939, but this time without America. Agreements for the general organization of the health service of the armies were drawn up for the American army by Col. Elliot Cutler, for the English army by Brigadier General Porritt and for the French army by Commanding Medical Officer Delvoye. General principles in the treatment of war wounded were presented by Colonel Cutler, Lieutenant Colonel Mitchell and Commanding Medical Officer Curtilliet. Colonel Cleveland, Lieutenant Colonel Eyre-Brook and Commanding Medical Officer Curtilliet presented reports on the treatment of war fractures. Emphasis was placed on the initial care, resuscitation and prophylaxis against infection, as well as on the equipment to be applied from the first lines, among these the pelvipedal (Tobruk) plaster and the thoracobrachial plaster. The discussion resulted in the drawing up of detailed instructions which were distributed widely among the doctors of the Allied armies and which codify the new data on war surgery. The next interallied conference, to be held this month, will consider the treatment of shock, wounds of the chest, abdominal and thoracoabdominal wounds and cranial injuries.

Budget for Public Health

The discussion of the budget for public health in the Consultative Assembly has revealed the lamentable state of health in France after the years of war and famine. The demographic situation, hardly satisfactory in the past, has become more serious. The number of deaths in 1939 exceeded the births by 29,000; the mortality rate was 15.5. Exclusive of the soldiers who died at the front, the prisoners and the deportees, it reached more than 18.0 in the course of the occupation and decreased to 17.0 in 1943. The infant mortality after the winter of 1944 was highest for this century. The morbidity followed the same trend. New cases of syphilis increased fivefold, typhoid fourfold and diphtheria threefold. Tuberculosis, amounting to 224 deaths per hundred thousand in 1930 and 172 in 1939, attained in 1942 the record figure of 234. There is a deplorable shortage of physicians, a catastrophic deficiency of nurses and social workers and lack of medicines. The number of hospitals is inadequate and their equipment is poor.

The minister of health has announced projected reforms, but the needs are of such magnitude that best intentions run the risk of only partial fulfilment. The political upheaval caused by the German occupation, the division of the country into two zones, later its reunion under complete Nazi control, and finally the liberation, have imposed on the legislative arrangements and the projected reforms certain modifications. When the provisional government of General de Gaulle came to power, a decree made a clean sweep of all the laws promulgated under the Vichy régime. But the majority of these laws were put back in force by the new minister. The names changed, but the basis and the doctrine remained unchanged.

The regulation of doctors, which before the war existed only in plan, was carried out under the German domination and has replaced the Confédération des Syndicates médicaux. The corporative idea was then in vogue and the syndicalist conception rejected. The government which then ruled France in the name of the Germans had in mind a program of reforms inspired by German institutions, but a program for which there was not enough time and the execution of which was nullified by the liberation. The present minister, M. Billout, has the task of reconstruction, to which he has applied himself since his entry into the ministry.

Several important features are to be noted in the program of the minister. Medical education is to be improved; the preparation of the physician will be more methodical and better balanced. A more rigid control will replace the liberty formerly enjoyed by the students. A better distribution of physicians over the entire territory is likewise contemplated. At the same time the training of medical aids, particularly of nurses, will be improved, and their social status bettered. Control of physicians created on a new basis, and regulated by the physicians themselves, control of midwives, of dentists and of pharmacists will be the task of the professions themselves. The old syndicates, reconstituted, will devote themselves to professional questions. A check will be established against the "fake" pharmaceutic specialties and the "black market" in medicines. The venereal diseases will be combated by education, prophylaxis, the rational organization of the services and the systematic search for carriers.

In Paris under the jurisdiction of special courts there will be 10,000 children and 30,000 in the provinces. More than 500,000 children do not attend school. These figures have been increasing since the beginning of the war. In a large number of these cases it is a question of temporary disorders associated with the war, the occupation and the famine; but these causes have not ceased to act. The absence of parents and elders, family disruptions, the unbearable material difficulties which have disorganized countless homes, are factors the moral and social disintegrating power of which cannot be measured.

Marriages

William Ferguson Pearce, Baltimore, to Lieut. Mary F. Young of Boston in Chalons-Sur-Marne, France, recently.

Franklin William Mallamo, Fairmont, W. Va., to Miss Dorothy Marie Bowler of Richmond, Va., June 18.

Lionelle Dudley Wells Jr., Holly Hill, S. C., to Miss Verdna Mildred Wohltmann of Charleston, June 28.

Leon Whitfield Robertson, Wake Forest, N. C., to Miss Virginia Mae Lancaster of Rocky Mount, June 23.

Victor T. Scoville, Constantine, Mich., to Miss Henrietta Fruend of Knoxville, Tenn., in Detroit, June 26.

Oliver Aiken Mays, Columbia, S. C., to Miss Anne Marilyn Swicegood of Summerville, March 5.

Edgar Joseph Reagan, Dayton, Ohio, to Miss Rosemary Blanche Stehle of St. Louis, June 16.

James Cuthbert Shecut, Orangeburg, S. C., to Miss Ella W. Lockwood of Charleston, July 2.

Walter Edward Bundy Jr., Oak Hill, W. Va., to Miss Jane Callison of Brooklyn, June 21.

Adolphus W. Dunn to Miss Doris Nash, both of Leaksville, N. C., June 23.

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Deaths

David Linn Edsall, distinguished in medicine as a teacher and leader, died in Cambridge, Mass., August 12, aged 76.

Dr. Edsall was born in Hamburg, N. J., July 6, 1869. He received the A.B. degree at Princeton University in 1890, M.D. at the University of Pennsylvania, Philadelphia, in 1893 and the Sc.D. at Princeton in 1913 and Harvard University in 1928. Dr. Edsall, on concluding his postgraduate education in London, Vienna and Gratz, entered the practice of medicine in Philadelphia, becoming immediately associated with the work of the medical department of the University of Pennsylvania, first as associate in the Pepper Clinical Laboratory and subsequently as instructor in medicine, associate, assistant professor of medicine, professor of pharmacology and therapeutics and professor of medicine. In 1911 he went to Washington University School of Medicine, St. Louis, as professor of preventive medicine. From 1912 to 1923 Dr. Edsall served as Jackson professor of clinical medicine at Harvard Medical School, from 1918 to 1935 dean, carrying a concurrent appointment from 1921 to 1935 as dean of the Harvard School of Public Health. He became emeritus in 1935.

In the American Medical Association Dr. Edsall was chairman of the Section on Pharmacology and Therapeutics in 1909-1910, a member of the Council on Pharmacy and Chemistry from 1908 to 1918 and First Vice President in 1919. He held membership in a number of scientific groups, including the Association of American Physicians, American Philosophical Society and the Society for Prevention of Infant Mortality and a retired membership in the Massachusetts Medical Society. He was a fellow of the American Academy of Arts and Sciences and once president of the American Pediatric Society, the American Society for Clinical Investigation and the American School Hygiene Association.

His early war service included activities in a consultant and advisory capacity on many national committees as well as on those organized in Massachusetts. He was a member of the committee on public health of the National Food Administration, a member of a committee appointed by the Working Conditions Service of the Department of Labor to draft a code to protect the health of explosives workers and a member and acting chairman of the committee on health of explosives workers of the National Research Council. He had been a member of a committee of five directed to guide the development of a department of industrial medicine and hygiene at Harvard and served as editor in chief of the *Journal of Industrial Hygiene and Toxicology* when it was created.

Dr. Edsall was noted as an educator and as an investigator. His interests were varied, extending to the industrial and social sides of medicine. One of his most important contributions in industrial hygiene was the discovery of "a disorder due to exposure to intense heat" among stokers on battleships and elsewhere, once known as Edsall's disease. His interest in occupational diseases led to the founding of the Occupational Clinic in the Massachusetts General Hospital.

Hugh Cabot ✙ Boston, died suddenly while sailing in Fisherman's Bay, Ellsworth, Maine, August 14, aged 73.

Dr. Cabot was born in Beverly Farms, Mass., Aug. 11, 1872, and graduated at Harvard Medical School, Boston, in 1898. He started practice in Boston in 1900, serving on the staff of the Massachusetts General Hospital from 1902 to 1919 and at Baptist Hospital from 1900 to 1919. He was assistant professor of surgery at Harvard Medical School from 1910 to 1918. After a year as clinical professor of surgery he went to the University of Michigan Medical School, Ann Arbor, as professor of surgery, a position held until 1930, serving a concurrent appointment as dean of the medical school from 1921 to 1930. He left Michigan to accept a professorship in surgery at the University of Minnesota Graduate School of Medicine, Minneapolis-Rochester, serving also as surgeon at the Mayo Clinic. Late in 1938 he went to Massachusetts.

Dr. Cabot was a member of the House of Delegates of the American Medical Association from 1911 to 1915 and chairman of its Section on Genitourinary Diseases, 1916-1917. He held membership in the American Surgical Association, American College of Surgeons, American Association of Genito-Urniary Surgeons, American Urological Association and the Clinical Society of Genito-Urinary Surgeons. He was a member of a numerous foreign societies related to his specialty, a member of the founders' group of the American Board of Surgery and a specialist certified by the American Board of Urology. During World War I he was chief surgeon of the Harvard Unit of the British Expeditionary Forces for a year in 1916 and commanding officer the following year; he held an honorary rank of lieutenant colonel in the Royal Army Medical Corps.

Dr. Cabot had been contributing to medical journals since 1900. He was the author of Surgical Nursing, the Doctor's Bill and the Patient's Dilemma and served as editor of *Modern Urology* in 1918 and its third edition in 1936.

During the later years of his life Dr. Cabot waged unrelenting war against the policies of the American Medical Association. He appeared in numerous public forums in opposition and also as a witness for the government in its indictment of the Association under the Sherman Act.

William Linder ✙ eminent surgeon, died in Olive Bridge, Ulster County, N. Y., August 11, aged 72.

Dr. Linder was born in Beregszasz, Hungary, July 4, 1873, coming to the United States in 1886. He returned to Europe for his postgraduate studies after graduating at Bellevue Hospital Medical College in 1896. He served his internship at St. Catherine's Hospital, Brooklyn, later becoming a member of the gynecologic staff there. In subsequent years he was also a member of the Wyckoff Heights Hospital, Rockaway Beach Hospital and the Israel Zion Hospital of Brooklyn, where he was surgeon in chief. In 1935, to honor his twenty-nine years' association with the Jewish Hospital of Brooklyn, the board of directors elected him "dean of surgery," a special recognition to enable him to remain in active service to the hospital. In 1924 he joined the staff of Long Island College of Medicine, becoming emeritus professor of clinical surgery in 1935. A member of the founders group of the American Board of Surgery, Dr. Linder was a fellow of the American College of Surgeons and of the New York Academy of Medicine and past president of the Medical Society of the County of Kings and the Brooklyn Surgical Society. He spent his winters in Florida, where he was a member of the state medical society and a member of the staffs of the Jackson Memorial, Miami, and St. Francis hospitals, Miami Beach.

Claude Elson Boyd, Amory, Miss.; Birmingham Medical College, 1911; member of the American Medical Association; president of the Northeast Mississippi Thirteen Counties Medical Society in 1933; died in the Baptist Hospital, Memphis, Tenn., June 9, aged 63, of heart disease.

Elizabeth Campbell ✙ Cincinnati; Woman's Medical College of Cincinnati, 1895; organized in 1909 the Cincinnati Visiting Nurse Association and in 1917 the Cincinnati Social Hygiene Society, serving both as their first president; founded in 1932 the Cincinnati Committee on Maternal Health, serving as chairman; in 1910 vice president of the Cincinnati Academy of Medicine; in 1942 given an honorary life membership in the American Social Hygiene Association, having served as a member of its board from 1925 to 1936 and from then until 1938 as vice president; in 1943 a portrait of her was unveiled at Christ Hospital in recognition of her forty-one years' service as a member of the staff; died June 7, aged 83.

Wilson Thompson Davidson ✙ Colonel, U. S. Army, retired, Belton, Texas; University of Texas School of Medicine, Galveston, 1896; fellow of the American College of Surgeons; entered the regular army as an assistant in 1901; veteran of the Spanish-American War and World War I; retired with the rank of lieutenant colonel on June 10, 1920 for disability in line of duty; under the Act of June 21, 1930 became a colonel; died in the Veterans Administration Facility, Dallas, May 19, 1944, aged 75, of cerebral hemorrhage and arteriosclerosis.

Carrol William Downey, Tallapoosa, Ga.; Atlanta Medical College, 1898; member of the American Medical Association; died April 8, aged 69.

William Vincent Eckhart, Marion, Ind.; Jefferson Medical College, Philadelphia, 1941; interned at the Atlantic City Hospital in Atlantic City, N. J.; entered the medical reserve corps of the U. S. Army as a first lieutenant on June 6, 1941; began active duty in the medical corps, Army of the United States, on Sept. 14, 1942; placed on inactive duty in April 1945; killed in an automobile accident May 17, aged 29.

John Miles Gibbons, New York; University of Pennsylvania Department of Medicine, Philadelphia, 1899; also a lawyer; retired general counsel of the New York, New Haven and Hartford Railroad Company; died in St. Luke's Hospital May 29, aged 81.

Salada Leon Goad, Marlow, Okla. (licensed in Oklahoma under the Act of 1908); died in Duncan May 25, aged 77.

Smith Gorsuch ✠ Castalia, Ohio; Ohio Medical University, Columbus, 1902; president of the Castalia Bank; member of the chamber of commerce; served as physician for the County Home; on the staff of the Providence Hospital, Sandusky, where he died May 23, aged 75.

Judge Gant Hambright, Roby, Texas; University of Louisville (Ky.) Medical Department, 1891; member of the American Medical Association; honorary member of the State Medical Association of Texas; died in a Sweetwater hospital May 28, aged 83.

Joseph Austin Hipp ✠ Olney Springs, Colo.; St. Louis College of Physicians and Surgeons, 1904; died in May, aged 76.

Samuel Hill Howard, Durant, Miss.; Memphis (Tenn.) Hospital Medical College, 1890; died June 19, aged 81.

Algernon B. Kidd, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1894; died April 24, aged 72.

John Dorsey Knox ✠ Warren, Ohio; Western Reserve University Medical Department, Cleveland, 1908; fellow of the American College of Surgeons; served during World War I; on the staff of the Warren City Hospital, where he died May 26, aged 63, of chronic myocarditis.

Carl Frederick Lewis, Jerseyville, Ill.; Bennett Medical College, Chicago, 1909; served overseas during World War I; died May 31, aged 60, of coronary thrombosis.

James Everett Maddux, Fulton, Calif.; Cooper Medical College, San Francisco, 1894; died in a hospital at Santa Rosa May 26, aged 81, of carcinoma of the stomach.

Mark Irving Makler ✠ Lynn, Mass.; Northwestern University Medical School, Chicago, 1927; member of the New England Pediatric Society; on the staffs of the Children's Hospital in Boston and the Lynn Hospital, where he died May 14, aged 42, of Hodgkin's disease.

William C. Marshall ✠ Yellow Springs, Ohio; Medical College of Ohio, Cincinnati, 1890; served as health officer of Greene County; on the staff of McClellan Hospital, Xenia, where he died May 31, aged 86, of coronary heart disease and arteriosclerosis.

George R. Meyer ✠ Marshalltown, Iowa; State University of Iowa College of Medicine, Iowa City, 1895; died May 17, aged 74, of cerebral hemorrhage.

Robert Bogie Miller, Cincinnati; University of Cincinnati College of Medicine, 1941; served an internship and residency at the Cincinnati General Hospital; died in the Good Samaritan Hospital May 4, aged 29, of pulmonary tuberculosis.

CAPT. VINCENT F. ATENE, M. C., A. U. S., 1913-1942

LIEUT. COMDR. D. H. BRUMBAUGH (MC), U.S.N.R., 1903-1945

CAPT. NEWTON ALEXANDER CANNON, M. C., A. U. S., 1914-1945

George B. Lawrence, Crab Orchard, Ky.; University of Louisville Medical Department, 1891; veteran of the Spanish-American War; died May 9, aged 80, of congestive cardiac failure.

Robert Bruce Miller, Lebanon, Ore.; University of Oregon Medical School, Portland, 1914; member of the American Medical Association; on the staff of the Lebanon General Hospital; died May 31, aged 59, of myocarditis and rheumatism.

KILLED IN ACTION

Vincent Francis Atene, Brooklyn; Creighton University School of Medicine, Omaha, 1938; interned at the Norwegian Lutheran Deaconesses' Home and Hospital; served a residency at the Victory Memorial Hospital and the Brooklyn Cancer Institute; began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 23, 1941; promoted to captain; posthumously awarded the Purple Heart and a Presidential Citation; transport surgeon; killed in action in the European theater Dec. 1, 1942, aged 29.

Donald Harmon Brumbaugh ✠ Redlands, Calif.; Stanford University School of Medicine, San Francisco, 1931; interned and served a residency at the San Bernardino General Hospital in San Bernardino; interned at St. Luke's Hospital in San Francisco; began active duty as a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 28, 1942; assigned as an area surgeon with marine artillery regiments at Camp Dunlap, Niland, Calif.; junior medical officer, U. S. S. *Hamlin*, a seaplane tender, in Tacoma, Wash., from April to September 1944, when he became senior medical officer on the U. S. S. *Birmingham;* received the Bronze Star Medal for action off Leyte in October 1944 while the *Birmingham* was aiding the U. S. S. *Princeton;* died in the Asiatic area May 4, aged 41, of extreme multiple injuries.

Newton Alexander Cannon, Vanleer, Tenn.; University of Tennessee College of Medicine, Memphis, 1941; interned at the Nashville General Hospital in Nashville, Tenn.; began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 1, 1943, later promoted to captain; killed in action in Luzon, P. I. March 31, aged 30.

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Ellsworth Eurit Moody ✠ Joplin, Mo.; Washington University School of Medicine, St. Louis, 1914; specialist certified by the American Board of Pediatrics, Inc.; on the staffs of the Freeman and St. John's Hospital; died in Greenup June 10, aged 53, of injuries received in an airplane accident.

Oliver M. Morris, Sheridan, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1897; Indiana University School of Medicine, Indianapolis, 1908; died May 14, aged 76, of carcinoma of the stomach.

Beriah Edwin Mossman, Youngstown, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the American Medical Association; past president of the Mercer County (Pa.) Medical Society; city physician; served on the surgical staff of the Greenville (Pa.) Hospital; on the honorary staff of the Youngstown Hospital Association; chief of Mercer County (Pa.) Draft Board in 1917; died May 3, aged 70, of coronary thrombosis.

Walter C. Myers ✠ Savannah, Mo.; Central Medical College of St. Joseph, 1897; past president of the Andrew County Medical Society; died April 17, aged 69, of chronic nephritis.

Charles W. Nehl, St. Louis; American Medical College, St. Louis, 1903; served as professor of osteosyndesmology and angiology at his alma mater; died April 22, aged 76, of chronic myocarditis.

William B. O'Bannon, Stanford, Ky.; Eclectic Medical Institute, Cincinnati, 1883; member of the American Medical Association; served as a member of the city council and as representative from Lincoln County to the state legislature; died April 22, aged 89.

William Henry Parsons, San Antonio, Texas; Hospital College of Medicine, Louisville, Ky., 1906; member of the American Medical Association; died May 22, aged 69, of cerebral hemorrhage.

Artie Blair Paul, Portland, Ore.; Jefferson Medical College of Philadelphia, 1924; member of the American Medical Association; served during World War I; died in the Veterans Administration Facility, Roseburg, May 16, aged 51.

Francis John Pellegrino, Castleton, Vt.; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1936; interned at White Plains Hospital in White Plains, N. Y.; began active duty as a first lieutenant in the medical corps, Army of the United States, on Aug. 24, 1942, with service terminated Sept. 20, 1944 because of physical disqualification; died in Boston May 20, aged 34.

Thomas Clayton Piles, Piedmont, Mo.; Missouri Medical College, St. Louis, 1890; past president of the Wayne County Medical Society; served as county coroner; on the staff of the Poplar Bluff (Mo.) Hospital April 10, aged 82, of chronic myocarditis and coronary occlusion.

George Washington Hull Presnell ✠ Sikeston, Mo.; Barnes Medical College, St. Louis, 1897; mayor of Sikeston; served as alderman; past president of the Scott County Medical Society; served during World War I; died May 26, aged 71, of leukemia.

Peter Francis Purcell ✠ Schenectady, N. Y.; Albany Medical College, 1911; served during World War I; on the staff of the Ellis Hospital; died May 2, aged 57, of dissecting aneurysm of the aorta.

Henry George Storner ✠ Olean, N. Y.; University of Buffalo School of Medicine, 1923; served as a member of the Fifty-Fourth Battery in the Field Artillery Officers Central Training School at Camp Zachary Taylor, Ky., during World War I; on the staffs of St. Francis and Olean General hospitals; died May 15, aged 46, of heart disease.

Benjamin G. Swanson Jr., Atlanta, Ga.; University of the South Medical Department, Sewanee, Tenn., 1907; died in a Savannah hospital March 17, aged 62.

LIEUT. RICHARD CHARLES DIAMON
M. C., A. U. S., 1917-1944

LIEUT. FELICE GEORGE SACCO
M. C., A. U. S., 1918-1945

CAPT. ANDREW CLEVE HEATH
M. C., A. U. S., 1914-1944

KILLED IN ACTION

Richard Charles Diamon, Herminie, Pa.; Jefferson Medical College of Philadelphia, 1943; interned at the Lankenau Hospital in Philadelphia; began active duty as a first lieutenant in the medical corps, Army of the United States, on Jan. 14, 1944; assigned to Northington General Hospital in Tuscaloosa, Ala.; killed in action due to air attack in Stalag, Germany, Dec. 23, 1944, aged 27.

Felice George Sacco, New York; Marquette University School of Medicine, Milwaukee, 1943; interned at the U. S. Marine Hospital in Staten Island; began active duty as a first lieutenant in the medical corps, Army of the United States, on Feb. 25, 1944; died January 15, aged 26, of wounds received in action in the Southwest Pacific area.

Andrew Cleve Heath, New Orleans; Louisiana State University School of Medicine, New Orleans, 1941; interned at the Charity Hospital; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 1, 1942; later promoted to captain; died of wounds received in Germany Dec. 21, 1944, aged 30.

Correspondence

ELECTROMYOGRAMS OF TREMORS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, July 7, a query appeared about electromyograms of tremors, by George H. Hoxie, M.D., Berkeley, Calif. The answer said that no tracings of the specific tremors described in the query are available in the medical literature. This answer was probably given by a writer who is not acquainted with literature outside this country. As a matter of fact, records of intention tremor were published by me in 1929 (Etude sur les phénomènes oscillatoires dans la sclérose en plaques, Royal Academy of Sciences at Amsterdam, Proc., vol 32, No. 1, 1929). The conclusion was that 80 per cent of so-called intention tremors have to be considered as atoxia instead of real tremors. Senile tremor and tremor of excitement were recorded in other publications. I mention Action-Tremor (*J. Nerv. & Ment. Dis.* **64**:1 [July] 1926; Phénomènes rhythmiques du système nerveux normal et malade, *Rev. neurol.* **1**:367; Tremors and Related Phenomena, *Nederl. tijdschr. v. geneesk.* **1**:472 [Jan. 28] 1928). A very good article entitled "The Nature of Tremors" was published in the *North Carolina Medical Journal* (**5**:15 [Jan.] 1944) by Arthur Allen Morris, M.D., from the Montreal Neurological Institute, Quebec, Canada.

A similar mistake was made some years ago by one of the authors in the reference of the answer to the query. The conception of tremor as a phenomenon of discharge in motor cells of the central nervous system and the pathophysiologic similarity of tremor and clonus was attributed to Wilson instead of to the undersigned.

HERMAN DE JONG, M.D., Durham, N. C.
Associate Professor of Neuropsychiatry,
Duke University School of Medicine.

THE GIANT CELLS IN HODGKIN'S DISEASE—ANCIENT ERROR IN MODERN MEDICINE

To the Editor:—It is difficult to determine just who is responsible for the preservation in modern medicine of the ancient error that the giant cells in the tissues of Hodgkin's disease were first described by the Austrian investigator Sternberg or by Dorothy Reed, an American. As a matter of truth they were first described by an Englishman, Greenfield, in 1878, twenty years before Sternberg called attention to them in 1898 and twenty-four years before the appearance of Reed's paper in 1902 and Andrew's paper at about the same time. Nevertheless these cells are frequently referred to as Sternberg's cells or as Dorothy Reed cells or as Sternberg-Reed cells and practically never as Greenfield's cells. In his presentation to the Pathological Society of London on April 2, 1878 on "Specimens Illustrative of the Pathology of Lymphadenoma and Leukocythemia," Greenfield followed the English custom of using the designation lymphadenoma synonymously with the term Hodgkin's disease. Greenfield stated that, in the microscopic examination of lymph "glands" in lymphadenoma ". . . . the fibrous stroma appeared coarser, and there were a large number of multinucleated cells adherent to the trabeculae, well seen on washing away the lymph cells. These multinucleated cells, containing from four to eight or twelve nuclei, were often collected in clusters in parts of the gland, especially where the fibrous change was progressing." One of his illustrations portrays numbers of multinucleated giant cells which, contrary to the statement just quoted from the text, show no connection with the surrounding fibrous trabeculae. This, however, is neither here nor there—the fact remains that the giant cells in the tissues of Hodgkin's disease were first described by Greenfield. Nor is it of much importance that he regarded them as multinucleated, thus differing from those who subsequently preferred to teach that the giant cells in Hodgkin's disease are mononuclear although multilobular but agreeing, in part at least, with those who believe that both varieties may occur. It seems to me that, if the giant cells in Hodgkin's disease are to be designated eponymously, the accolade should go to Greenfield (Greenfield, W. S.: *Tr. Path. Soc. London* **29**:272, 1878). In the same connection it is interesting to recall that Sternberg interpreted the histologic changes in pseudoleukemia (the German synonym for Hodgkin's disease) as revealing a "peculiar variety of tuberculosis of the lymphatic apparatus." The next year (1899), however, he courageously reversed himself and announced the view that the cause of pseudoleukemia is "still unknown." Although Sternberg's renunciation is seldom mentioned, his original opinion is resurrected sometimes to support the theme that tuberculosis follows Hodgkin's disease "like a shadow."

Hodgkin's disease provides another example of ill bestowed credit in the form of the Pel-Ebstein eponym. In 1887 Pel of Amsterdam and Ebstein of Göttingen independently of each other described a syndrome in Hodgkin's disease characterized by gradual ascent of the patient's temperature to 103 or 104 F., where it is maintained for a period of three or four days, sometimes longer, after which it descends and the patient remains afebrile for an interval of about ten days or two weeks (Pel, P. K.: *Berl. klin. Wchnschr.* **24**:644, 1887. Ebstein, W., *ibid.* **24**:565, 837, 1887). Similar reactions occur with almost predictable regularity over periods varying from several months to a year or more. Precisely the same syndrome was described by Murchison seventeen years previously in a paper which appears in the *Transactions of the Pathological Society of London* under the title of "A Case of 'Lymphadenoma' of the Lymphatic System, Spleen, Liver, Lungs, Heart, Diaphragm, Dura Mater, &c." (Murchison, C.: *Tr. Path. Soc. London* **21**:372, 1870). The histologic examinations were carried out by Burden Sanderson. Neither Murchison nor Sanderson seemed to be any too sure that the disease was an example of Hodgkin's "lymphadenoma." This uncertainty was reflected not only in the title of Murchison's paper, where the word lymphadenoma is in quotation marks, but also in the text, where he refers several times to the resemblance of the disease to "tubercle or cancer." Sanderson's woodcuts depicting the microscopic changes do not bear the slightest resemblance to the histology of Hodgkin's disease as it is now known. On the other hand one of them (page 385) shows microscopic features which are strangely reminiscent of the malignant tumor that is more or less familiarly known to pathologists as perithelioma or perithelial sarcoma, the naked eye appearances of which may resemble those of cancer and the structural unit of which is a small blood vessel. Incidentally, the syndrome in question, contrary to common precept, is not peculiar to Hodgkin's disease but has been noted also in certain forms of caseous pulmonary tuberculosis as well as in necrotic tumors, among them hypernephromas and perithelial sarcomas. Wherever encountered it would appear to be more appropriately referred to as Murchison's syndrome. By all this I do not mean to imply that writers on the subject of Hodgkin's disease are alone in the matter of rendering unto Caesar those things which do not rightfully belong to Caesar. That is by no means true, as witness the fact that Addison described primary progressive (idiopathic) pernicious anemia seventeen years before Biermer, that Parry of Bath described toxic diffuse goiter ten years before Graves and fifteen years before Basedow, that Winiwater, a Swiss army surgeon, described what is currently designated Buerger's disease twenty-nine years before the appearance of Buerger's paper, that Edward Selleck Hare in the days of his house officership at the Stafford Infirmary during the late eighteen thirties described the precise equiva-

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lent of the now familiar "Pancoast's syndrome" (superior pulmonary sulcus tumor), including Horner's symptom complex, thirty years before Horner and nearly a century before Pancoast, and so on (Hare, E. S.: *London M. Gaz.* **1**:16, 1838-1839).

DOUGLAS SYMMERS, M.D., New York.
General Director of Laboratories, Department of Hospitals, City of New York.

NODULAR VASCULAR DISEASE OF THE LEGS

To the Editor:—The article "Nodular Vascular Diseases of the Legs," by Montgomery, O'Leary and Barker (THE JOURNAL, June 2, p. 335), should not go unchallenged. The authors have attempted to define a new entity, "nodular vasculitis," and to differentiate it from erythema induratum. Because the authors are eminent, there is danger that their conclusions will be accepted and that an ill defined entity will enter the medical nomenclature to confuse all physicians who are not dermatologists.

In the differential diagnosis between "nodular vasculitis" and erythema induratum they state that the nodules tend to be more painful in the former and that erythema induratum tends to occur in younger women. These distinctions are not valid, for the nodules of undoubted erythema induratum may be extremely painful and may occur at any age. After analyzing their paper, one must assume that they have really only one point of differentiation between "nodular vasculitis" and erythema induratum, and that is the presence or absence of undoubted tuberculous lesions elsewhere in the body.

The senior authors presented a woman aged 54 with a diagnosis of nodular vasculitis before the Minnesota Dermatologic Society in 1943 (O'Leary, P. A.; Montgomery, Hamilton, and Brunsting, L. A.: A Case for Diagnosis, *Arch. Dermat. & Syph.* **50**:212 [Sept.] 1944). The woman had purplish red, deep seated tender nodules of the medial and posterior aspects of the legs from the ankles to the middle of the thighs of five months' duration. In the antetibial areas were healed scars dating from a skin infection of several months' duration during childhood. Her father had pulmonary tuberculosis. A roentgenogram of the chest was normal and the tuberculin test with purified protein derivative elicited a negative reaction in the first dilution. A biopsy from one of the lesions showed obliterative changes in the vessels, areas of epithelioid cells, foreign body giant cells and collections of plasma cells. In the discussion of this case Dr. Montgomery minimized the significance of the presence of the giant cells and epithelioid cells and emphasized the predominance of the vascular changes. Yet six months later, as they state in their article in THE JOURNAL, this same woman presented a histologically proved tuberculous cervical adenitis and a strongly positive tuberculin test.

The various tuberculids which the dermatologist encounters are so typical in their appearance, distribution and clinical course that the detection of other tuberculous lesions are not necessary for a correct diagnosis—and so it is with erythema induratum.

The question as to whether or not there is an entity such as "nodular vasculitis" is of more than academic importance. If one should decide that such a diagnosis is acceptable in a particular patient, then that patient will be offered no other treatment than the wearing of elastic supports of some kind. However, if the diagnosis of erythema induratum is made, the prognosis may be excellent because erythema induratum frequently responds to treatment with tuberculin, gold sodium thiosulfate, neoarsphenamine or one of the newer trivalent arsenicals such as dichlorophenarsine hydrochloride-U. S. P.

C. RUSSELL ANDERSON, M.D., Los Angeles.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Aug. 18, page 1188.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: January. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS: * *Medical.* Little Rock, Sept. 20-21. Sec., Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, Nov. 11. *Written.* Sacramento, Oct. 15-18. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

COLORADO: * Denver, Oct. 2-5. Final date for filing application is Sept. 17. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: * *Medical. Examination.* Hartford, Nov. 13-14. *Endorsement.* Hartford, Nov. 27. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, Sept. 10. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

ILLINOIS: Chicago, Oct. 9-11. Supt. of Registration, Department of Registration & Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, Aug. 28-30. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis 4.

KANSAS: Topeka, Dec. 6. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

MAINE: Portland, Nov. 13-14. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 11-15. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 20-23. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSISSIPPI: Jackson, Sept. 26-27. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 1-4. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, October. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

RHODE ISLAND: * Providence, Oct. 4-5. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 15-16. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Capitol Bldg., Pierre.

TEXAS: Dallas, Sept. 4-6. Sec., Dr. T. J. Crowe, 918-920 Texas Bank Bldg., Dallas 2.

VERMONT: Burlington, March or April 1946. Sec., Dr. F. I. Lawliss, Richford.

WEST VIRGINIA: Charleston, Oct. 4-6. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Madison, Jan. 8-10. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 1-2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Sept. 5-6. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 13. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 22-23. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 3. Sec., Dr. J. F. Conn, Box 655, DeLand.

IOWA: Des Moines Oct. 9: Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Oct. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

SOUTH DAKOTA: December. Sec., Dr. J. D. Alway, Aberdeen.

TENNESSEE: Memphis, Sept. 24-25. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WISCONSIN: Madison, Sept. 22. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee 3.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry Practice Acts: Prohibition of Advertising Concerning Price Upheld.—The National Optical Stores Company operate five "stores" in Wisconsin. Apparently it was claimed that the stores in question merely sold optometrical merchandise, such as glasses, lenses and frames. It appeared, however, that glasses were sold on the prescription of an optometrist or physician and that a physician is kept in a store to prescribe glasses for the plaintiffs' customers under an "arrangement" in which a room is furnished the physician, the physician fixing a fee of $1 or $2 for examining the eyes of a customer and collecting directly from the customer. The plaintiffs, however, guaranteed the physician a specific amount as fees for a specific period. With respect to one of the Wisconsin "stores" an advertisement was inserted in one of the local papers that purported to offer bifocal double vision glasses of a $12 value for $3.88. The ad exhorted its readers to "get the glasses you need at prices you can afford"; that there was "no extra cost" and "no extra charge." A section of the Wisconsin optometry practice act (Wisconsin Statutes, section 153.10) makes it unlawful for any person to advertise directly or indirectly by any means whatsoever any definite or indefinite price or credit terms on lenses, frames, complete glasses or any optometric service or to advertise in any manner that will tend to mislead or deceive the public. Apparently the Wisconsin Board of Examiners in Optometry threatened to institute proceedings under this section and Benjamin D. Ritholz and others, who were copartners operating the stores, brought an action in equity to enjoin the board from prosecuting them for purported violation of that statute. They claimed that the statute was unconstitutional under the Fourteenth Amendment to the United States Constitution, which, among other things, prohibits a state from abridging the privileges or immunities of citizens of the United States or of depriving any person of life, liberty or property, without due process of law, or from denying to any person within its jurisdiction the equal protection of the laws. The trial court issued a judgment declaring the statute void as in contravention of the constitutional provision just noted and enjoined the board from proceeding against the plaintiffs. The board then appealed to the Supreme Court of Wisconsin.

As to the question as to whether or not, as applied to the practices of the plaintiffs, the provision of the optometry practice act prohibiting advertising any price or terms on optometric mechandise or optometric services violated the constitutional provision referred to, the court regarded itself as bound by its holding in *Modern System Dentists* v. *State Board of Dental Examiners*, 216 Wis. 190, 256 N. W. 922. In that case this court upheld certain rules validly promulgated by the Board of Dental Examiners specifically prohibiting advertising essentially the same as the advertising here involved. Ritholz and the other defendants claimed, however, that that case was not in point here because dentistry is a profession and selling glasses and lenses, such as was done by the National Optical Stores, is merely merchandising. But, answered the court, by their own advertising the plaintiffs profess to do more than merely sell glasses. They advertise to sell glasses to fit the needs of the public, which under the provisions of the optometry practice act requires the services of a person licensed to practice either optometry or medicine. Neither of these is mere merchandising. The basis of the rule applicable to dentists is not that they are professional men but that the advertising prohibited to them tends to deceive and mislead the public, and the reason for the rule is as applicable here as there. The instant statute does not purport to affect the mere merchandising of glasses that does not require the services of an optometrist to prescribe them. The plaintiffs may sell glasses that aid sight by merely magnifying or protecting against excessive sunlight. So they may sell stock glasses where the customer fits himself by trying on glasses in the seller's stock on hand. But we do not have to rest the constitutionality of this statute wholly on our previous decision in the dentist case. The evidence in this case shows that the advertising used by the plaintiffs actually does operate to defraud the public. The customers of the plaintiffs are mostly poor persons and by the plaintiffs' own testimony their advertisements are designed to reach "workers, foreigners and Negroes" particularly. They use the advertisements as a lure or bait, or, as they call it, "an inducement" to draw such persons to their stores. The advertisement on its face is dishonest. It manifestly aims and tends to mislead the public and is therefore fraudulent advertising. This conclusion is inescapable, in the court's opinion, in view of the "setup" in the plaintiffs' stores. The "arrangement" between the physician and the plaintiffs constitutes the physician an "employee" of the plaintiffs. By the testimony of the plaintiffs' general sales agent, when a customer arrives he is ushered into a room occupied by the physician employed by the plaintiffs, who proceeds to make the examination of the customer's eyes. When the physician has completed his examination, he writes out what he calls a prescription and demands $1 or, in some cases, $2 for it. If the customer protests the fee on the ground that the advertisement pursuant to which he came to the store represented that there would be "no extra charge" for examination, the physician answers that the fee is not for glasses but for the prescription. This is, continued the court, on its face a mere subterfuge. Nearly all customers "fall for it" and pay the fee. A plain bare fraud is thus perpetrated. The aim and practice of the plaintiffs, as shown by the testimony of their sales manager and by the "Manual of Instruction" to their salesmen, is to sell the customer the highest priced glasses and frames possible to foist on him even though the complete glasses advertised at $3.88 would supply his need as well. This in the case of a customer who is wealthy or is well to do may be good salesmanship, but it is against the public welfare when it is done to the poor or the class of customers whom the plaintiffs mostly serve. And so as to filching a dollar for examination from the class of customers with whom the plaintiffs mostly deal.

While there may be disagreement in the decisions of courts of last resort, continued the court, on the proposition as to whether or not an ordinary trader can be prevented from advertising the price at which he will sell eye glasses, there is unanimity in the court decisions in this field on the proposition that any advertising that tends to deceive or mislead is a fraud on the public and in our view that rule applies to the present plaintiffs. It is quite true that some of the advertising done by the plaintiffs is not within the ban of the statute. But clearly some of it is, and clearly the plaintiffs cannot enjoin all prosecution under the statute when part of its advertising is banned. Nor can they come into court for advice as to what advertisements they may make through seeking an injunction against prosecution for alleged legal advertising. If the plaintiffs are prosecuted under the statutes for advertising that they consider not fraudulent and the prohibition of it by statute therefore unconstitutional they can assert their claim in defense. This constitutes an adequate legal remedy and thus bars an action in equity.

The judgment of the lower court enjoining the enforcement of the section as against the plaintiffs was in effect reversed and the cause was remanded to the lower court with directions to dismiss the bill of complaint.—*Ritholz et al. v. Johnson et al., 17 N. W. (2d) 590 (Wis. 1945).*

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Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

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Graduate Surgical Training in America. C. M. Smyth Jr.—p. 793.
*Local Fluid Loss, Nerve Stimuli and Toxins in Causation of Shock. D. B. Phemister and C. H. Laestar.—p. 803.
*Stainless Steel Wire Mesh in Repair of Small Cranial Defects. E. Boldrey.—p. 821.
Fracture of Atlas. J. J. Hinchey and W. H. Bickel.—p. 826.
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Problem of Massive Hemorrhage from Duodenal Ulcers of Patients Beyond Middle Life. H. K. Gray and W. S. Sharpe.—p. 840.
Pancreaticoduodenectomy for Islet Carcinoma. A. O. Whipple.—p. 847.
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*Frozen Human Skin Grafts. M. M. Strumia and C. C. Hodge.—p. 860.
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Bone Sarcoma in Polyostotic Fibrous Dysplasia. B. L. Coley and F. W. Stewart.—p. 872.
Spontaneous Rupture of Axillary Artery. F. B. St. John, J. Scudder and Dorothy L. Stevens.—p. 882.
Unusual Case of Meckel's Diverticulum. S. Gendel and M. G. Beaver.—p. 891.

Causation of Shock.—Experiments were conducted on 38 dogs divided into three groups. The trauma was limited to the right hind limb. No evidence was obtained from these experiments that either a flow of nociceptive stimuli from the injured field or toxin formation is an important contributing factor in the initiation of circulatory impairment or shock which followed. The animals in which the trauma was applied soon after the administration of spinal anesthesia were protected from shock principally by the blockage of the vasomotor and (less importantly) motor nerves, which greatly lowered the blood pressure and limited the hemorrhage to an amount that was too small to produce shock, instead of by blockage of afferent impulses. The maintenance of such a low blood pressure by spinal anesthesia for the prevention of shock during an operation on man is contraindicated, as the amount of anesthetic required would be too toxic. In all the experiments in which shock developed, the local blood loss was large and constituted the main causative factor. There appears to be no indication for the renewal of efforts to prevent shock by the blockage of afferent nerve impulses through the use of local or spinal anesthesia. Indications for the use of local or spinal anesthesia in shock are based on other grounds.

Stainless Steel Wire Mesh in Repair of Small Cranial Defects.—Boldrey says that small cranial defects ranging in size from burr holes to openings approximately 2 inches in diameter have excited little attention and have generally been shrugged off as of no serious consequence. Yet burr holes in the frontal region result in unsightly depressions and may be associated with tenderness. They have sometimes been filled with bone dust or with buttons removed with the trephine, but these bits of bone absorb rapidly and so fail in the purpose for which they are used. Stainless steel wire, when used in the skull, does not show the disadvantages attributed to it when it is used for orthopedic purposes in other bones of the body. Wire used to hold osteoplastic bone flaps in position or in myoplastic craniotomies becomes tightly embedded within the bone as osseous repair takes place. It seemed reasonable that a mesh of stainless steel wire would become anchored in connective tissue and possibly in bone at the edges of a cranial defect. The mesh was tried first in dogs and later the use of both the 0.0065 inch (40 by 40) and 0.0075 inch (28 by 28) screen was begun in patients. During the past eighteen months it has been used for small defects and has been regarded as satisfactory. There have been no ill effects. None of these patients have died or have required further surgery in the same region, so that no human pathologic material is available. When used to cover frontal burr holes, a layer of screen is placed between the dura and the skull before the bone flap is replaced. This remains in position without sutures. Another piece is added outside the skull, as the double mesh seems to give a better cosmetic result. With limitations, mesh appears to offer a safe, adaptable and readily available method of dealing with small cranial defects.

Frozen Human Skin Grafts.—Strumia and Hodge transplanted 41 autogenous split thickness grafts, preserved in the frozen state from one to sixty-one days, at temperatures of minus 20 to minus 25 C. (minus 4 to minus 13 F.), to 3 patients. These grafts resulted in 80.5 per cent permanent takes. Thirty-four control grafts of fresh skin in the same patients resulted in 86.4 per cent takes. The result of grafting does not appear to be affected by the time of storage of the grafts in the frozen state, at least within the experimental limits mentioned. Aside from the possible development of skin banks for homografts, the preservation of split thickness autogenous grafts in the frozen state allows the operator to obtain at one operation large numbers of grafts which may be employed for transplantation at any time later on.

Archives of Internal Medicine, Chicago

75:357-426 (June) 1945

Albright's Syndrome (Polyostotic Fibrous Dysplasia with Cutaneous Pigmentation in Both Sexes and Gonadal Dysfunction in Females). M. B. Dockerty, R. K. Ghormley, R. L. J. Kennedy and D. G. Pugh.—p. 357.
Infectious Mononucleosis: Analysis of 300 Cases with 3 Characterized by Rare Hematologic Features. J. T. Read and F. C. Helwig.—p. 376.
Azotemia Associated with Gastrointestinal Hemorrhage: Experimental Etiologic Study. R. Gregory, P. L. Ewing and H. Levine.—p. 381.
Aplastic Anemia and Its Association with Hemochromatosis. K. Zeltmacher and Margery Bevans.—p. 395.
Pernicious Anemia in Chinese. S. O. Schwartz and Lilly A. Rappolt.—p. 404.
*Large Doses of Ascorbic Acid in Treatment of Vitamin C Deficiencies. Emma D. Kyhos, E. L. Sevringhaus and Dorothy Hagedorn.—p. 407.
Primary Systemic Amyloidosis of Alimentary Tract. A. Golden.—p. 413.
Gastroenterology: Review of Literature from July 1943 to June 1944. W. L. Palmer, D. S. Harman and W. E. Ricketts.—p. 417.

Large Doses of Ascorbic Acid in Vitamin C Deficiencies.—Kynos and her associates studied the effects of large doses of synthetic ascorbic acid on urinary excretion, plasma and whole blood in 26 patients hospitalized for other ailments but judged to be also deficient in vitamin C on the basis of history, clinical signs and low plasma content of ascorbic acid. The efficiency of single doses of ascorbic acid of 100 to 500 mg. was excellent if the plasma level of ascorbic acid was low. Some patients received as much as 1.5 Gm. of ascorbic acid in one day without significant urinary loss, while the plasma content of vitamin C was increased to high normal levels. The total amount of ascorbic acid supplement required to produce a twenty-four hour excretion of 40 mg. or over varied from 0.5 to 2.0 Gm. and the amount required for saturation from 1.5 to 2.8 Gm. Intravenous administration of ascorbic acid resulted in slightly greater excretion in a few cases. The authors observed evidence of a wide individual variation in the renal threshold for ascorbic acid, the probable plasma level for this series being 1.1 and 1.9 per hundred cubic centimeters. It was not demonstrated that a determination of the whole level is superior to that of the plasma level in diagnosing vitamin C deficiency. Patients with low plasma values generally excreted very small amounts of ascorbic acid until the dose had raised the plasma levels above 1.0 mg. Patients having renal involvement or blood dyscrasias responded atypically to ascorbic acid treatment. Although age does not seem to influence the results of ascorbic acid treatment, there seems to be some evidence that sex plays a part. Fluctuations have been observed in the plasma content of ascorbic acid in connection with certain phases of the menstrual cycle.

Archives of Neurology and Psychiatry, Chicago

53:329-398 (May) 1945

*Experimental Studies on Headache: Transient Thickening of Walls of Cranial Arteries in Relation to Certain Phenomena of Migraine Headache and Action of Ergotamine Tartrate on Thickened Vessels. C. Torda and H. G. Wolff.—p. 329.
Cerebral Injury by Blunt Mechanical Trauma: Special Reference to Effects of Repeated Impacts of Minimal Intensivity; Observations on Experimental Animals. C. G. Tedeschi.—p. 333.
Studies of Sensation of Vibration: III. Evidence for Cortical Areas in Inhibition and Mediation of Tickle. G. K. Yacorzynski and L. Davis. —p. 355.
Pretraumatic Personality and Psychiatric Sequelae of Head Injury: I. Categorical Pretraumatic Personality Status Correlated with General Psychiatric Reaction to Head Injury Based on Analysis of 200 Cases. H. L. Kozol.—p. 358.
Effect of Sodium Amytal and Amphetamine Sulfate on Mental Set in Schizophrenia. P. E. Huston and Mary M. Singer.—p. 365.
Effectiveness of Diphenylhydantoin in Management of Nonepileptic Psychomotor Excitement States. F. A. Freyhan.—p. 370.
Human Pyramidal Tract: XI. Correlation of Babinski and Pyramidal Syndrome. A. M. Lassek.—p. 375.
Primitive Habits and Perceptual Alterations in the Terminal Stage of Schizophrenia. S. Arieti.—p. 378.

Migraine Headache.—Torda and Wolff state that distention of cranial arteries induces pain of an aching quality. The speed with which vasoconstrictor agents such as ergotamine tartrate reduce the intensity of the headache approximates the rate of constriction of the cranial arteries. In many patients the headache arises in the distended branches of the external carotid arteries, although any or all of the cranial arteries may be involved in migraine headache. Secondary to pain from prolonged distention of cranial arteries, the skeletal muscles of the neck and scalp contract and become painful. After several hours of such a headache the vessel may appear more prominent and distended. Instead of being collapsible it becomes rigid, pipelike and less readily compressible. Patients may report that after the first hour or two of an attack of migraine the quality of the headache may change in that the initial pulsating or throbbing headache turns into a steady ache. To account for these changes the authors have postulated that after sustained dilatation there occurs thickening or edema of the muscular and adventitial structures. Sections taken from the temporal artery of patients during attacks of migraine involving this structure revealed on microscopic examination that there was thickening of the arterial wall. Since comparable control sections during periods of freedom from headache cannot be obtained, the authors studied the structure of the arteries of the ears of 6 cats after infusion for two hours of 10 cc. of mammalian isotonic solution of three chlorides containing 0.5 mg. of acetocholine bromide per hundred cubic centimeters. Measurements demonstrated thickening of the walls of the infused vessels. Ergotamine tartrate was less effective in constricting arteries with thickened walls than arteries with normal walls. It is suggested that during attacks of migraine the cranial arteries involved may undergo similar changes after prolonged vasodilatation. Such changes may explain the rigid, pipelike texture of the arteries, the steady aching pain and the tenderness of these structures when headache has persisted for many hours. Also these changes may explain the decreased ability of ergotamine tartrate to reduce promptly the intensity of prolonged headache.

Archives of Otolaryngology, Chicago

41:319-394 (May) 1945

Problem of Aviation Deafness: The Airman, His History and His Plane. P. A. Campbell.—p. 319.
Effect of Barometric Pressure Changes on Hearing. C. M. Kos.—p. 322.
Effect of Aircraft Noise on Hearing. B. H. Senturia.—p. 327.
*Inhalation Method for Penicillin Therapy: Preliminary Report. E. W. Hagens, Mary Karp and C. J. Farmer.—p. 333.
*Use of Microcrystals of Sulfathiazole in Otolaryngologic Practice. D. G. Ornston.—p. 337.
Treatment of Extensive Cicatricial Stenosis of Larynx or Trachea. J. B. Erich.—p. 343.
Survey of Literature on Tuberculosis—1940-1943. G. E. Wilson, assisted by W. K. Stern.—p. 355.

Inhalation of Penicillin.—Hagens and his co-workers treated 22 patients with penicillin by the inhalation method. Urine and blood levels showed that the drug is absorbed from the lungs to a sufficient degree. Because of its local effect the inhalation of penicillin may be the method of choice in cases of pulmonary disease. The inhalation of penicillin results in temporary improvement in bronchiectasis, but the condition frequently lapses back shortly after therapy is discontinued. In most cases gram negative bacteria are encountered, so that another antibiotic substance is also necessary, one to which these bacteria are sensitive. Asthmatic patients who have a superimposed bronchial infection with an organism to which they possibly are allergic may be favorably influenced by treatment. Acute pulmonary conditions respond to the inhalation treatment. The method may be used advantageously in the treatment of children and other patients when the intravenous or the intramuscular injections of penicillin are unsuitable.

Microcrystals of Sulfathiazole in Otolaryngologic Practice.—Ornston used microcrystals of sulfathiazole as a 5 per cent or a 20 per cent suspension in isotonic solution of sodium chloride and as a 5 per cent suspension with 1 per cent paredrine hydrobromide in isotonic solution of sodium chloride. He presents his experiences with the microcrystals in the common cold and its complications, in subacute sinusitis, in chronic maxillary sinusitis, in otitis media, in mastoidectomy and in miscellaneous conditions. The local use of microcrystalline sulfathiazole to combat infections of the upper respiratory tract presents the advantages of freedom from mechanical irritation, prolonged action at the site of infection and effective bacteriostatic action. In a controlled series of cases of subacute suppurative ethmoiditis the instillation of drops or the use of displacement showed that the sulfonamide compound reduced the amount and the duration of the discharge and decreased the incidence of complications. In cases of subacute sinusitis other than ethmoiditis, relief was prompt. In 8 of 11 cases of chronic maxillary sinusitis this condition was cured or improved by irrigation and filling with the microcrystals. Twenty-seven chronically suppurating ears were treated with the suspension, blown in through the auditory tube; in 5 the condition was cured and in 4 improved; in 18 there was no improvement. In all of these cases otitis had resisted other therapeutic methods. Local use of the microcrystals in operative wounds resulted in less drainage and tissue reaction and accelerated healing. No foreign body reaction was observed. Local application of sulfonamide compounds may obviate the necessity of oral administration.

Archives of Pathology, Chicago

39:351-424 (June) 1945

Poikilocytosis in Dairy Cattle. J. T. Reid, C. F. Huffman and C. W. Duncan.—p. 351.
Experimental Reproduction of Madduromycotic Lesions in Rabbits. D. Symmers.—p. 358.
Phialophora Jeanselmei Comb. N. from Mycetoma of Hand. C. W. Emmons.—p. 364.
Acute Agranulocytosis: Microscopic Study of Ulceronecrotic Gingiva of Bone Marrow in a Case. G. J. Anday and B. Orban.—p. 369.
Aortic Abnormalities in Dogs for Experimental Purposes. W. C. Hueper.—p. 375.
Combined Effects of an Estrogen and Anterior Hypophysial Extract on Skeleton of Growing Mouse. M. Silberberg and Ruth Silberberg. —p. 381.
Tularemia: Report of Laboratory Infection Fatal on Fifth Day, with Early Pulmonary Involvement; Autopsy. L. L. Ashburn and S. E. Miller.—p. 388.
Intracranial Vascular Tumors and Malformations. H. N. Noran.—p. 393.

Archives of Physical Medicine, Chicago

26:325-378 (June) 1945

*Observations on Muscle Spasm in Poliomyelitis: Electromyographic Studies on Effect of Various Forms of Thermal Therapy and of Prostigmine. A. L. Watkins and Mary A. B. Brazier.—p. 325.
Artificial Fever-Chemotherapy: IV. Prefever Preparation and Postfever Care. G. X. Schwemlein, H. W. Kendell and R. M. Craig.—p. 329.
Physical Medicine in Rehabilitation of Patients with War Neuroses. A. B. Knudson.—p. 336.
Functional Treatment of Fractures and Other Injuries. E. H. Wilson. —p. 349.
Physical Medicine in Industry. J. M. Carlisle and R. O. McMorris. —p. 353.
Photographic Record of Joint Motion. G. D. Wilson and W. H. Stasch. —p. 361.

Electromyographic Studies in Poliomyelitis.—Hypersensitivity or spasm of muscles has been emphasized as one of the most characteristic aspects of the acute stage of poliomyelitis. Watkins and Brazier studied the influences of single applications of a therapeutic agent on muscle spasm during the first weeks of the disease. All patients were in the early

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infectious stage, and studies were restricted to adult patients. Six such patients were available for study. In all, 835 measurements were made, the first test usually being done within a few days after diagnosis had been established. Muscle spasm was measured by quantitation of the electrical discharges released on five seconds of passive stretching by known weights in order to test the effect of twenty minute applications of hot packs, infra-red radiation, luminous heat, short wave diathermy and the intramuscular injection of neostigmine (1.6 mg.) on this electrical component of spasm. Single applications of hot packs, infra-red radiation and diathermy had no effect. Luminous heat and neostigmine caused a decrease in spasm of approximately 25 per cent. This degree of change was not great enough to indicate a specific effect on spasm.

Bull. of New York Academy of Medicine, New York

21:281-334 (June) 1945

*Mass Sulfadiazine Prophylaxis of Respiratory Diseases in U. S. Navy. A. F. Coburn.—p. 281.
Distant Secondary Circulatory and Vasomotor Reactions to Accidental Electric Shock. G. H. Hyslop.—p. 302.
*Role of Bilateral Orchiectomy in Treatment of Carcinoma of Prostate Gland: Report of 82 Cases. W. W. Scott and J. A. Benjamin.—p. 307.

Mass Sulfadiazine Prophylaxis of Respiratory Diseases.—According to Coburn the first objective of this program was to check the rapidly rising respiratory infection morbidity rates in the winter of 1944 by preventing the implantation of pathogenic bacteria in the nasopharynx. Continuous chemoprophylaxis was selected as the most promising control measure. To test the applicability of chemoprophylaxis under controlled conditions and to determine a standard prophylactic dose of sulfadiazine, programs were designed for five large northern training stations with high respiratory disease rates. Groups of trainees were then selected to receive sulfadiazine prophylaxis and comparable groups to serve as untreated controls. Sulfadiazine prophylaxis has been administered to approximately 600,000 naval personnel, and approximately 300,000 similar personnel have been observed as controls. The institution of this measure was followed by a great reduction in the morbidity rates for respiratory diseases. The incidence of respiratory symptoms observed at sick call was significantly lowered. Hospital admissions for respiratory diseases were reduced from rates varying between 5 and 18 per thousand monthly to less than 1 per thousand monthly. Meningococcic infections were eliminated. The incidence of pneumococcic pneumonia was significantly lowered at most naval stations. Morbidity rates for respiratory diseases caused by filtrable viruses were unaffected. The most effective dosage tested was 1 Gm. daily. The administration of 0.5 Gm. of sulfadiazine daily was also found effective and was followed by fewer untoward reactions. Mild, untoward drug reactions were observed in about 0.5 per cent. Severe reactions occurred in 0.01 per cent of men taking 1.0 Gm. of sulfadiazine daily. Sensitization to sulfonamides and the development of sulfadiazine fast respiratory pathogens did not occur.

Orchiectomy in Carcinoma of Prostate.—Scott and Benjamin report the results obtained by bilateral orchiectomy in the treatment of 82 patients in various stages of carcinoma of the prostate gland. In the majority of patients the early response of metastatic symptoms was much more rapid and satisfactory than had been obtained by the methods in common use before its introduction. The early response of urinary symptoms was neither so frequent nor so satisfactory. A small percentage of patients received little or no benefit from this therapy. Most of the patients treated by this method were either dead or had lost its initial benefits within thirty-six months. In view of the discouraging end results following this therapy the authors believe that a follow-up radical perineal prostatectomy should be seriously considered in selected cases when the response to therapy is such that there is a reasonable chance for the removal of all or almost all of the primary lesion. As yet there is no substitute for radical perineal prostatectomy for cancer of the prostate when the patient's condition and the size and location of the lesion at the time of the first examination permit its complete removal.

Canadian Medical Association Journal, Montreal

52:445-542 (May) 1945

New Aspects of Virilism. L. Berger.—p. 445.
War Wounds: The Present Status of Their Treatment. R. I. Harris. —p. 450.
*Role of X-Rays in Diagnosis of Posterior Herniation of the Intervertebral Disk. A. E. Childe.—p. 458.
Infected Chest Wounds and Suction Drainage. K. D. Panton.—p. 470.
Radiologic Findings in Lesser Sac Effusion. M. C. Morrison.—p. 474.
Pathologic Manifestations and Anatomic Variations in Preenlistment Chest Roentgenograms. F. G. Stuart.—p. 477.
Postoperative Survival Periods in Gastrointestinal Carcinomata. L. H. Appleby.—p. 481.
Experiences with Pentothal During the First Hundred Days Following the Normandy Invasion. G. A. Wainwright.—p. 484.
Use and Abuse of Vitamins. L. B. Pett.—p. 488.
Some Problems of Neonatal Life. S. G. Ross.—p. 491.
Practical Methods of Supplying the Essential Vitamins of Childhood. Elizabeth C. Robertson.—p. 494.
Value of Orthoptics in Treatment of Strabismus. A. L. Morgan.—p. 498.
*Relief of Asthma by Sulfa Therapy: Report of 2 Cases. W. W. Bell. —p. 504
Epidemic Jaundice (review of literature). H. Mitchell.—p. 505.

X-Rays in Diagnosis of Posterior Herniation of Intervertebral Disk.—At the Montreal Neurological Institute and at the No. 1 Canadian Neurological Hospital various methods have been used to diagnose herniation of the intervertebral disks. Since early in 1942 the injection of iodized oil, with subsequent aspiration, has become routine. During part of this period lipiodol has been the medium, but pantopaque is much to be preferred, not only because it is much more easily injected and aspirated but also because it moves more freely. There is the additional advantage that any small amount which may be left in place is gradually spontaneously absorbed. While it is not as radiopaque as lipiodol, it is sufficiently dense for practical purposes. Childe stresses that plain x-ray films should always be made first. These films usually are not diagnostic of such a herniation but may offer suggestive evidence and they help to exclude other lesions. Myelography when properly performed using pantopaque with subsequent aspiration is an accurate and safe method. Multiple disk herniations are not uncommon, and many unsatisfactory results may be explained on this basis if operation is undertaken without previous myelography. Herniation of sufficient size to produce great disability may cause only comparatively small deformities of the subarachnoid space. Hence the use of a relatively large quantity of oil is advisable, and multiple spot films should be made routinely to avoid missing minor deformities not readily seen under the fluoroscope. Myelography reveals that the size of some herniations undergoes change due to such factors as weight bearing, traction, muscular activity, flexion and extension. Herniated intervertebral disks in the cervical region are often complicated by hypertrophic bone formation. Tumors in the lumbar and sacral regions, and occasionally in the cervical region, may produce signs and symptoms which are clinically indistinguishable from those produced by herniated intervertebral disks. Myelography will usually differentiate between a tumor and a herniated disk.

Relief of Asthma by Sulfonamide Therapy.—Bell presents the histories of 2 patients with severe bronchial asthma each of whom was resistant to epinephrine and each of whom had paranasal sinusitis with streptococci as the main organism of infection. Both showed dramatic response to sulfonamide therapy. The first patient, a woman aged 48, was unable to retain sulfanilamide or sulfathiazole but tolerated sulfadiazine. The second patient, a man aged 58, responded to sulfathiazole. The author does not suggest that sulfonamides are a cure for asthma but states that 2 patients received great benefit and in the second patient it appeared to be a life saving agent.

Connecticut State Medical Journal, Hartford

9:413-502 (June) 1945

Present Day Problems of Hospital and Staff. G. C. Adie.—p. 418.
Cancer Organization and Propaganda: Suggestions for Its Improvement. C. L. Larkin.—p. 423.
Impact of Cancer Program on Medical Profession. A. N. Creadick. —p. 428.
Tropical Disease and Connecticut Physician. M. Tager.—p. 430.
Chemotherapy of Nasal Sinus Disease. E. J. Whalen.—p. 435.
Unusual Case of Scorbutus. C. H. Sprague.—p. 438.
Physical Examination at Induction Station (New Haven Recruiting and Induction Station, New Haven, Conn.). C. V. Verstandig.—p. 439.
Daniel Webster and Hay Fever. C. Barker.—p. 442.

Journal of Lab. and Clinical Medicine, St. Louis

30:475-558 (June) 1945. **Partial Index**

Nutritional Survey in Norris Point, Newfoundland. J. Metcoff, Grace A. Goldsmith, A. J. McQueeney, R. F. Dove, Ellen McDevitt, Margaret A. Dove and F. J. Stare.—p. 475.
Parenteral Nutrition: I. Studies on Fat Emulsions[1] for Intravenous Alimentation. J. M. McKibbin, A. Pope, S. Thayer, R. M. Ferry Jr. and F. J. Stare.—p. 488.
Timing of Phagocytic Changes in Malnutrition. Esther Cottingham and C. A. Mills.—p. 498.
Administration of Penicillin by Continuous Intramuscular Drip. R. O. Smith and C. G. Harford.—p. 502.
*Actinomycotic Infection of Soft Tissues of Neck: Apparent Cure Following Large Doses of Penicillin: Case Report. J. H. McCrea, R. A. Stevens and O. O. Williams.—p. 509.
Prothrombin in Preserved Blood. R. F. Banfi, A. Tanturi and R. Bay. —p. 512.
Isolation of Hemolytic Streptococci from Throat Swabs: II. Efficiency of Human and Rabbit Blood in Streaked and Streaked-Poured Plates. R. M. Pike, with technical assistance of Helen Leonard.—p. 518.
Clinical Significance of Serum Protein (Albumin and Globulin) Changes. E. Muntwyler.—p. 526.
*Use of Test Paper for Rapid Estimation of Sulfonamides in Blood and Other Body Fluids. W. V. La Rosa.—p. 551.

Actinomycosis of Neck Treated with Penicillin.—The subject of the report by McCrea and his associates was a man aged 28 who developed soreness in the region of the lower molars. A diagnosis of impaction of third molars was made and the teeth were extracted. A localized area of induration remained in the soft tissue of the neck. There was pain on motion of the right temporomandibular joint. The patient developed an ischiorectal abscess, which was drained. A subsequent swelling of the lower jaw subsided, but an indurated area persisted in the soft tissues inferior to the mandible. Several months later there was an increase in swelling and tenderness. The mass in the neck was gradually enlarged. A sinus developed inferior to the middle third of the right mandibular ramus. A culture taken revealed Staphylococcus aureus. Penicillin was given intramuscularly in doses of 20,000 units every three hours for three days but caused no appreciable improvement. Pus obtained later contained yellow granules which on staining revealed mycelia and clubbing typical of actinomycosis. Since small doses of penicillin had failed to effect cure on previous hospitalization, massive doses were now given, 7,000,000 units being administered over a period of fourteen days. The initial dose was 120,000 units and the later doses were 80,000 units. The status several months after this massive penicillin treatment indicated complete cure.

Test Paper for Rapid Estimation of Sulfonamides.—The test described by La Rosa makes use of Ehrlich's reagent, p-dimethylamino benzaldehyde, in the formation of a Schiff base with primary aromatic amines, as first described by Kuhnan in 1938. The test paper contains this reagent with a sufficient quantity of oxalic acid to give a p_H of 2.5 when wet with serum or other biologic fluids. By the use of the test paper the level of sulfonamide can be estimated directly in plasma, serum and other clear body fluids without the addition of precipitating or acidifying agents. The orange yellow color produced is evaluated by comparison with an appropriate color chart or with colors produced simultaneously from solutions of known concentrations. The test paper can be prepared from a good grade of white absorbent paper. It can be stored in the dark in covered glass jars for from five to ten days. The validity of this method has been demonstrated on 518 blood samples.

Med. Annals of Dist. of Columbia, Washington, D. C.

14:193-238 (May) 1945

Psychiatry in Brazil. O. Camargo.—p. 193.
Plans for Federal Employees' Health Service. J. W. Cronin.—p. 199.
Venereal Disease Prophylaxis. N. Belt.—p. 203.
Penicillin Therapy in Ambulatory Gonorrhea Patients. G. W. Creswell and L. E. Putnam.—p. 205.
Sternal Transfusions in Infants: Report of Fatal Case. V. J. Dardinski. —p. 206.

14:239-286 (June) 1945

The Future of Physical Medicine. F. H. Krusen.—p. 239.
Mental Health. W. Overholser.—p. 246.
Studies on Neuromuscular Dysfunction: VI. Neostigmine Therapy of Neuromuscular Dysfunction. H. Kapat.—p. 248.
Simple Method for Disposing of Direct Inguinal Hernia Sac. O. C. Cox and H. J. Forrest.—p. 255.

Minnesota Medicine, St. Paul

28:357-424 (May) 1945

Brief Review of Present Trends and Needs of Medical Practice. J. A. Lepak.—p. 357.
Ringworm of Scalp. C. W. Laymon.—p. 363.
Nursing in Rural Hospitals. B. C. Ford.—p. 367.
Local Health Service—Proposal of American Public Health Association. H. Emerson.—p. 370.
Additional Data on Penicillin Administration. W. R. Bagley.—p. 372.

28:425-520 (June) 1945

Accumulated Experience of Department of Pathology, University of Minnesota, Neuropsychiatric Material: II. Brain Trauma. R. L. Meller.—p. 449.
Systemic Sarcoidosis. J. F. Briggs.—p. 452.
Stenosis of Sigmoid of Newborn. W. R. Bagley and E. C. Bagley. —p. 453.
Renal Rickets. R. E. Nutting and A. H. Wells.—p. 458.

New York State Journal of Medicine, New York

45:1153-1204 (June 1) 1945

Sudden and Unexpected Natural Death: General Considerations and Statistics. M. Helpern and S. M. Rabson.—p. 1197.
Pharmaceutic Treatment of Ringworm of Toes. H. Goodman.—p. 1202.
Interpretation of Visual Fields in Neurotic Patients. J. F. Gipner. —p. 1203.
Myelography with Ethyl Iodophenylundecylate (Pantopaque). G. H. Ramsey, J. D. French and W. H. Strain.—p. 1209.
Wilms' Tumors. A. L. Dean.—p. 1213.
Significance of Hyposthenuria in Prostatism, with Special Reference to Nocturia: Clinical Study. J. A. Lazarus and M. S. Marks.—p. 1218.

45:1265-1374 (June 15) 1945

Further Experiences with Surgical Treatment of Intractable Ulcerative Colitis. J. H. Garlock.—p. 1309.
*Hodgkin's Disease: Salient Clinical Features and Relative Value of Various Methods of Treatment Based on Study of 319 Cases. L. B. Goldman and A. W. Victor.—p. 1313.
Anterior Poliomyelitis—The 1944 Epidemic at Meadowbrook Hospital. J. W. Lansberg.—p. 1319.
Coitus, Impotentia and Angina Pectoris. M. M. Melicow.—p. 1325.
Report of 93 Cases of Meningococcus Infection Admitted to Station Hospital Camp Butner, North Carolina (from November 1942 to September 1943). R. W. Houseal and M. J. Gerbasi.—p. 1329.
Vaginal and Endometrial Smear as Diagnostic Procedure in Cancer of Uterus. G. N. Papanicolaou.—p. 1336.
Roentgen Therapy of Arthritides. I. I. Kaplan.—p. 1339.

Hodgkin's Disease.—Goldman and Victor report 319 cases of Hodgkin's disease. The youngest patient in the group was 5 and the oldest 76 years of age. A clinical diagnosis of Hodgkin's disease can frequently be made by palpation of the involved lymph nodes. It is possible to count from 3 to 5 nodes in each of the involved groups. The nodes may vary in size from 2 to 12 cm. As a rule more than one area is involved. Thirteen of the authors' patients showed involvement of the sternal nodes, never before mentioned in the literature. The skin was involved in 39 per cent of the patients. Roentgenographic findings in the chest characteristic only of this disease were never found. There was a gradual transition from a bilateral thickening of the hilar areas to a widening of the mediastinum and invasion of adjacent lung fields. Hodgkin's disease of the gastrointestinal tract was observed in only 2 patients. It was unusual to palpate the spleen in ambulatory patients. The abdominal form of Hodgkin's disease was observed in 27 patients. They exhibited weakness, loss of weight, intermittent bouts of fever and a more rapid course. Collapse of a vertebra may occur without symptoms of spinal cord compression. The characteristic changes in the sternal marrow were a polymorphonuclear shift to the right with severe toxic granulation, increased eosinophilia of young myeloid elements and increase in the monocytic series. Pregnancy occurred in 11 patients; therapeutic abortions were performed in 3; miscarriage resulted in 1, and the pregnancies were carried to term in the remaining 7. There was no evidence of Hodgkin's disease in the offspring. Even under the most optimal conditions permanent arrest of the disease has not been obtained, but useful life has been prolonged for many years. The patient should receive the smallest quantity of irradiation that is compatible with relative well-being, just sufficient to cause gross disappearance of involved lymph nodes. The authors utilized a voltage of 200 kilovolts, a filtration of 0.5 copper and 1 aluminum, a port of 10 by 15 cm. and a skin-target distance of from 40 to 50 cm. Voltages that were either higher or lower produced inferior results. In addition to the irradiation the patient should receive supportive hematinic therapy.

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North Carolina Medical Journal, Winston-Salem

6:265-308 (June) 1945

Recent Advances in Treatment of Cardiovascular Disease. E. S. Orgain. —p. 265.
Patent Ductus Arteriosus with Superimposed Subacute Bacterial Endarteritis: General Considerations and Report of Cure by Surgical Ligation. M. Dick and R. A. Broome Jr.—p. 274.
*Intravascular Accident. W. H. Sprunt and S. W. Hurdle.—p. 278.
Increasing Incidence of Toxemias of Third Trimester of Pregnancy. R. B. Dunn.—p. 283.
Medical Management of Gallbladder Disease. S. F. LeBauer.—p. 285.

Ohio State Medical Journal, Columbus

41:513-588 (June) 1945

Questions and Answers Concerning the Fenestration Operation. C. E. Kinney.—p. 513.
Penicillin Therapy in Subacute Bacterial Endocarditis. S. A. Hatfield, D. L. Mahanna and H. H. Fertman.—p. 515.
Practical Application of Quantitative Serologic Tests for Syphilis. A. I. Weiner and Marie McNamara.—p. 517.
Identical Twins: Achondroplastic Dwarfs. S. J. Goodman.—p. 521.
Review of Allergy. J. Forman.—p. 522.
Management of Addison's Disease. E. P. McCullagh and R. W. Schneider.—p. 528.
Peptic Ulcer as it Occurred at Station Hospital: Report of 207 Consecutive Cases. R. C. Kirk.—p. 532.
Fatal Hemolytic Reaction Following Transfusion with Incompatible Blood. A. J. Mantilla.—p. 534.
Medical Curiosities—Phosphorus. R. M. Watkins.—p. 537.

Quantitative Serologic Tests for Syphilis.—According to Weiner and McNamara the true potency (amount of reagin) of syphilitic serums may be determined, as in the Widal reaction, by quantitative titration of the serums. The recent trends in the rapid treatment of early syphilis have stimulated interest in the use of quantitative serodiagnostic tests. Quantitative serologic tests have been found essential to the optimum treatment of early syphilis and useful in the management of latent and tertiary syphilis. They are also of value in the study of suspected false positive reactions and in the interpretation of the status of the newborn of syphilitic mothers. Protracted seroresistance and clinical complications, especially neurosyphilis, occur predominantly in those patients with early syphilis who have experienced mucocutaneous relapse, a phenomenon usually preceded by a persistent rise in the serologic titer. Impending relapse, which is thus detected by quantitative serologic tests, can often be prevented by intensification or modification of the therapy which is being administered. The routine adoption of quantitative serologic procedures in early syphilis is urged. These tests are of more limited usefulness in other phases of syphilis.

Quarterly J. of Studies on Alcohol, New Haven, Conn.

6:1-130 (June) 1945

Biochemical and Electroencephalographic Changes in Delirium Tremens. M. A. Kennard, E. Bueding and S. B. Wortis.—p. 4.
Alcoholic Deaths in Canal Zone, 1904 to 1944. M. T. Hoekenga and B. H. Kean.—p. 15.
Relation of Pituitary Gland to Some Symptoms of Alcoholic Intoxication and Chronic Alcoholism. M. Gross.—p. 25.
Ecologic and Familial Factors Associated with Inebriety. Harriet R. Mowrer and E. R. Mowrer.—p. 36.
The Churches and Alcohol. R. H. Bainton.—p. 45.
Certain Expenditures on Account of Inebriety. B. Y. Landis.—p. 59.
Estimated Consumer Expenditures for Alcoholic Beverages in the United States, 1890-1943. B. Y. Landis.—p. 92.
Classics of Alcohol Literature: A Sixteenth Century English Alewife and Her Customers—Skelton's Tunnyng of Elynour Rummyng.—p. 102.

Rhode Island Medical Journal, Providence

28:333-396 (May) 1945

Erythroblastosis Fetalis. B. H. Buxton and H. C. McDuff.—p. 333.
Absenteeism in Industry. J. J. Wittmer.—p. 338.
Exodontia and Minor Oral Surgery. W. A. Daniels.—p. 347.
Tuberculosis Case Finding. J. J. Pickney.—p. 360.

28:397-480 (June) 1945

Recent Advances in Control of Infectious Diseases. F. G. Blake. —p. 409.
Medical Care in Rhode Island.—E. S. Wing.—p. 416.
Report of Case of Empyema Treated with Penicillin. L. I. Kramer. —p. 425.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

18:99-132 (April) 1945

Benign Tumor of Esophagus and Its Differential Diagnosis. R. A. K. Harper.—p. 99.
New Circuit with Special Applications in Gamma Ray and X-Ray Dosimetry. L. A. W. Kemp.—p. 107.
Review of 3 Gastric Cases with Positive Radiologic and Negative Laparotomy Findings. F. G. Nicholas.—p. 113.
Technic for Autoradiographs of Radium Containers. Dorothy F. Clephan.—p. 117.
War Wounds of Urinary Tract. D. B. McGrigor and E. Samuel. —p. 121.
*Protection Measurements on Operators and Workrooms in Radium Dial Painting Industry. J. C. Jones and M. J. Day.—p. 126.
Unusual Sequel to Fracture of Odontoid Process: Case Report. H. Davies.—p. 132.

Protection Measurements in Radium Dial Painting Industry.—Jones and Day review investigations that were carried out to determine how far safety regulations were successful in the radium dial painting industry. Owing to their low penetrating power, the alpha rays can cause damage to the tissues only by immediate contact. Although stopped by a few millimeters of most solid materials, the beta rays penetrate several meters of air, giving intense local ionization in the region of the source. The hands are subject to the greatest exposure from these rays. The harmful effects of general body irradiation by gamma rays are well known and the tolerance dose rate of 1 roentgen per week is generally accepted. The safety measures fall into two groups. First, precautions designed to reduce the unavoidable exposure to a minimum and to improve the general conditions of work. Second, direct examination of the operatives for indications of overexposure, entailing on the medical side routine blood testing, inspection of the hands for signs of local effects and attention to the general health of the workers, and on the physical side the wearing of beta and gamma ray sensitive photographic films and tests for radium in the body. Measurements carried out by the authors indicated that workers in most ordinary luminizing factories are not suffering from excessive exposure either from contamination of the atmosphere with radon or radium dust or by the direct action of beta and gamma rays from outside the body. In some cases the ventilation of darkrooms could be improved. Workers with larger quantities of radium, such as in the preparation of luminous compound, are exposed to greater risks. The authors regard the risk of the inhalation of radium dust as particularly important.

British Medical Journal, London

1:545-578 (April 21) 1945

*Two School Outbreaks of Streptococcal Throat Infection: Effect of Sulfonamide Lozenges on Carriers. R. L. Vollum and G. S. Wilson. —p. 545.
Surgery and Anesthesia of War Wounds of Abdomen. S. O. Aylett and A. F. Alsop.—p. 547.
Bacteriologic Examination of Infected Dental Pulp Canals and Use of Penicillin in Pulp Canal Therapy. F. E. Shaw, Evelyn Sprawson and H. B. May.—p. 551.
*Penicillin in Wounds of Chest. A. L. D'Abreu and J. W. Litchfield. —p. 553.
Case of Penicillin Reaction. W. Michie and H. W. C. Bailie.—p. 554.
Subglottic Stenosis After Exposure to High Concentration of Screening Smoke (Zinc Chloride). R. B. Lumsden and C. D. Weir.—p. 554.
Intestinal Obstruction by Gallstones. M. Lee.—p. 555.

Streptococcic Throat Infection.—Vollum and Wilson report an outbreak of scarlet fever due to Streptococcus pyogenes type 11 in a residential preparatory school for boys and an outbreak of sore throat accompanied by cases of scarlet fever due to type 1 in a residential public school for girls. Treatment of healthy and of convalescent carriers with 6 to 12 lozenges a day for five to seven days, each lozenge containing ½ grain (32 mg.) of sulfapyridine and ½ grain of sulfathiazole, had no apparent effect as compared with control carriers receiving either an antiseptic spray and hypochlorite gargle or no treatment at all in clearing the infecting type of streptococcus from the throat. Prophylactic treatment of healthy contacts with 6 lozenges a day had no effect in preventing streptococcic infection of the throat. Observations made on persons sucking

methylene blue tablets showed that only a fraction of the dye was deposited on the tonsils and none on the posterior pharyngeal wall. Lozenges containing sulfonamide drugs are not likely to be of value for the prophylaxis or for the cure of streptococcic infection of the throat.

Penicillin in Wounds of Chest.—Since penicillin has become available, over 500 penetrating wounds of the thorax have been treated. General parenteral treatment with penicillin was used only occasionally and has not supplanted the sulfonamide drugs, which may often be used with less distress to the patient, as they do not involve three hourly injections. Repeated intrapleural injection of penicillin without bacteriologic and radiologic check is unwise. Intrapleural injection of 60,000 units in 6 to 10 cc. (no more) at the end of the first two or three aspirations is advised by D'Abreu and Litchfield; this injection does not replace adequate aspiration. At the general hospital the uninfected hemothorax is treated by aspiration without intrapleural instillations except (1) when there is coexistent chest wall sepsis, (2) when there is pulmonary infection and (3) when at the conclusion of a thoracotomy for foreign body removal air has been drawn off by an artificial pneumothorax apparatus. Local use of penicillin in case of infection is advisable only in cases of infection by penicillin sensitive organisms. Bacteriologic checks are essential. Despite sterilization of an empyema cavity, operative treatment is necessary in certain cases for the purpose of removing clot and preventing excessive deposition of fibrin on the pleura.

Edinburgh Medical Journal

52:97-144 (March-April) 1945

Theory of Anaphylaxis and Therapeutic Possibilities in Rheumatism. W. M. Levinthal.—p. 97.
Functions of Stomach in Relation to Treatment of Peptic Ulcer. C. F. W. Illingworth.—p. 119.
Tomography. J. B. McDougall.—p. 127.
Clinical Value of Blood Sedimentation Diagram: Preliminary Report. H. Dugosz.—p. 132.

Lancet, London

1:487-518 (April 21) 1945

*Clostridial Infections in War Wounds. W. T. Cooke, A. L. P. Peeney, G. Thomas, and others.—p. 487
Atypical Pneumonia. R. W. D. Turner.—p. 493.
Distribution of Sulfamezathine in Body Fluids: Relation to Cranial Injuries. M. Kremer, C. G. Phillips and M. W. Stanier.—p. 496.
Local Action of Penicillin and Sulfamezathine and Penicillin-Sulfamezathine Mixture on Rabbit Brain. D. S. Russell and D. J. K. Beck.—p. 497.
*Fixation of Skin Grafts with Human Plasma and Thrombin. A. M. Clark, J. P. Todd and G. R. Milne.—p. 498.

Clostridial Infections.—The evacuation of a large group of wounded men from the Western Front from June to October 1944 afforded Cooke and his associates the opportunity of making clinical observations. Cases which showed a systemic reaction and gave evidence of clostridial infection were examined. From 2,680 wounded men a group of 76 cases with systemic reactions have been studied. All but 4 of this group showed evidence of clostridial organisms in their wounds. It is suggested that this group includes the majority of true and potential "gas gangrene" cases. The group has been further subdivided on the basis of the severity of the systemic reaction into four sections of increasing severity, the last consisting of 2 fatal cases. The 2 fatal cases, 7 of the severe and 18 of the moderate group gave a histopathologic picture of clostridial myositis. Possible significant features in the biochemical findings were low blood cholesterol and high urine creatine levels. While the hematologic studies showed evidence of a hemolytic process in some cases, severe hemolysis was not a feature in any case. Flocculation of chylomicrons occurred in a number of cases, but this is not specific for clostridial infection nor can it be attributed to the direct action of clostridial toxins. At necropsy in the 2 fatal cases extensive fat embolism of the lungs and other organs was demonstrated and demyelination was found in the central nervous system.

Fixation of Skin Grafts.—Clark and his associates employed a modification of the method of fixation of skin grafts described by Sano. Instead of withdrawing blood from the patient, they use citrated plasma and instead of Sano's cell extract they use thrombin solution. The plasma used is obtained from blood of a group AB donor. Plasma as supplied by the blood transfusion services should not be used, for this has been treated to remove the clotting elements. The raw surface of the graft is painted with the solution of thrombin before application, and it is then applied to the recipient area, which has been previously painted with the plasma. The authors have used this method successfully in the grafting of over sixty burns. They stress that complete and continuous contact of the skin and the underlying tissues is secured. Oozing of blood is controlled and the skin is fixed in position by means of a medium favorable for tissue growth. The method is quicker, since it largely obviates the need for stitching the graft in position. It is not necessary to obtain blood from the patient before grafting, for the materials are available from the local transfusion services.

1:519-550 (April 28) 1945

Order and Disorder in Large Intestine. T. L. Hardy.—p. 519.
Battle Casualties Treated with Penicillin. A. Innes and V. H. Ellis.—p. 524.
Effects of Sulfonamides on Bone Phosphatase. P. H. Silver and J. S. R. Golding.—p. 528.
Dermatitis from Cutting Oils. G. P. B. Whitwell.—p. 529.
Local Instillation of Penicillin in Lung Abscess. D. Pickering and R. Grenville-Mathers.—p. 530.
*Fatal Air Embolism During Blood Transfusion. E. G. Dolton, E. Gardner and W. D. Wylie.—p. 531.

Fatal Air Embolism During Blood Transfusion.—While a man aged 53 was undergoing an operation for carcinoma of the stomach, blood transfusion was begun through the left saphenous vein at the ankle. After two and one-half hours the blood transfusion, which had slowed considerably, was accelerated by raising the pressure in the bottle by means of a Higginson syringe, in accordance with routine practice. About fifteen minutes later the temporal pulse suddenly became impalpable and the patient rapidly became cyanosed. Inflation of the lungs with oxygen was substituted for the anesthetic mixture, but without improvement. At necropsy the right auricle was punctured under water which filled the pericardium, and from this puncture a number of air bubbles escaped. The inferior and superior venae cavae and the innominate and jugular veins were distended by large and small air bubbles and contained only a little red frothy blood. Though they have found no record of a similar accident, Dolton and his associates think that it can hardly be the first example. Probably some deaths attributed to shock of operation or status lymphaticus are actually due to air embolism, which goes unrecognized because routine postmortem methods do not reveal it. The method of forcing transfusion with a Higginson syringe is dangerous unless constant close supervision is exercised.

South African Journal Medical Sciences, Johannesburg

10:1-56 (Feb.) 1945

Behavior of Graafian Follicle of Elephantulus During Pregnancy, with Special Reference to Hormonal Regulation of Ovarian Activity. C. J. van der Horst and J. Gillman.—p. 1.
*Effect of Testosterone Propionate on Menstrual Cycle of Normal Female Baboons (Papio Porcarius) as Compared with Progesterone and Desoxycorticosterone Acetate. Christine Gilbert and J. Gillman.—p. 15.
Cell Masses in Forebrain of Elephant Shrew. M. K. Wright.—p. 19.
Reactions of Perineum of Pregnant Baboon, with Special Reference to Some Aspects of Hormonal Regulations of Pregnancy. Christine Gilbert and J. Gillman.—p. 31.

Effect of Testosterone Propionate on Menstrual Cycle.—Gilbert and Gillman show that testosterone propionate is capable of inducing premature deturgescence in normal baboons when administered in sufficient concentration in the first part of the cycle. The induced deturgescence may be succeeded by premature bleeding, and a new cycle is initiated thereafter. If the induced deturgescence is not followed by bleeding, menstruation may be postponed for ten to fifteen days. There are differences in effects on the normal female baboon between testosterone propionate and progesterone. Unlike desoxycorticosterone acetate, testosterone propionate, like progesterone, is incapable of producing bleeding twice within the span of a normal menstrual cycle. In 2 of the 9 animals testosterone propionate excited a reaction which is similar to that obtained after a single treatment with 5 mg. of estradiol benzoate in the first part of the cycle.

Policlinico (Sez. Prat.), Rome

52:1-32 (Jan. 1-31) 1945. **Partial Index**

*Functions of Bone Marrow in Some Forms of Chronic Hepatitis. M. Milela.—p. 1.

Bone Marrow in Chronic Hepatitis.—Milela reports microscopic observations on the bone marrow obtained by sternal puncture in 13 cases of chronic hepatitis. There were 4 cases of atrophic cirrhosis of the Laënnec type, 4 of syphilitic hepatitis, 1 of amebiasis of the liver, 1 of Hanot cirrhosis, 1 of Eppinger cirrhosis and 2 cases of chronic ascitogenic hypertrophy of the liver. Erythropoiesis was inadequate in all of the cases. The maturation of the erythrocytes was arrested at the level of the polychromatic phase. Anemia in chronic disease of the liver is apparently due to the toxic action of the diseased liver on the bone marrow.

Archivos de Neurocirugía, Buenos Aires

1:129-250 (April-June) 1944. **Partial Index**

*Acute Cerebral Edema and Mesencephalic Hemorrhages as Cause of Death in Metastatic Tumors. R. M. E. Carrea.—p. 228.

Acute Cerebral Edema.—Carrea points out the cause of death in intracranial hypertension due to metastatic cerebral tumors. There is either a mesencephalic hemorrhage from cisternal hernia or cisternal hernia alone. Mesencephalic hemorrhage is fatal, whereas cisternal hernia is curable. Cisternal hernia of the temporal lobe is frequent in cerebral tumors. It manifests itself by a sudden appearance of symptoms of acute cerebral edema leading to respiratory difficulty which may rapidly result in respiratory paralysis. Treatment consists in putting the patient to bed with the head at a lower level than the feet. Intravenous injection of hypertonic dextrose solution and continuous ventricle drainage or repeated evacuation by ventricular puncture and transfusions of human plasma are indicated. Hypertonic sodium chloride solution is contraindicated. Failure of the therapy calls for surgical intervention, either section of the neck of the hernia or temporal lobectomy. When respiratory failure occurs just before the operation, artificial respiration should be practiced as long as the heart beats. The author's patient died from an acute respiratory paralysis. The heart continued beating for about ten minutes. Death was due to acute cerebral edema with formation of a huge cisternal hernia at the temporal lobe and an associated mesencephalic hemorrhage.

Obst. y Ginecología Latino-Americanas, Buenos Aires

3:71-154 (Feb.) 1945. **Partial Index**

*Erythroblastosis of Newborn Infants and Rh Factor. M. A. Etcheverry, H. Linares Garzón and J. C. Pereyra.—p. 93.

Erythroblastosis of Newborn Infants.—Etcheverry and his collaborators report observations on a family of 4 erythroblastotic infants. The young parents were apparently normal. The mother had three normal deliveries and an induced abortion. The first child was born with sclerema and had had convulsions from infancy. The 2 following infants died within one and two weeks after birth from acute jaundice and from acute hemolytic anemia. In the course of the fifth pregnancy it was established that the blood of the mother belonged to blood group A and was Rh negative, whereas that of the father and of the child belonged to blood groups O and A respectively and was Rh positive. Anti-Rh agglutinins were not present in the blood of the mother during the first months of pregnancy. They appeared about the eighth month of pregnancy and increased with such rapidity that it was necessary to induce labor near full term. The infant girl was born apparently normal. Her blood was of group A and was Rh positive. The blood of the umbilical cord showed strong reticulocytosis, highly increased indirect bilirubinemia and a scanty number of erythroblasts. Microscopic study of the placenta showed abnormal persistence of the Langhans layer, intraplacental hematoma with erythroblasts, erythroblasts in the chorionic vessels, and edema and hyperplasia of the chorionic villi. The infant exhibited jaundice three hours after birth. Transfusion with O-Rh negative blood in amounts varying between 20 and 50 cc. each was made four hours after birth and at intervals of twelve hours during the first week of life of the infant. She had fever during the first three days and splenomegaly. Jaundice became acute during the first week and then subsided. During the second week of life of the infant transfusion of O-Rh positive blood was administered by mistake. Immediately afterward the infant presented symptoms of acute anemia, which became grave in four days. The hemogram confirmed the diagnosis. The condition was controlled by transfusions of A-Rh negative blood. It was given first daily, then every other day and at longer intervals in doses of 50 to 180 cc. The infant was normal when discharged from the hospital at the age of 3 months. The authors direct attention to the meaning of sclerema in the newborn, which suggests erythroblastosis of the newborn in the family. They also point to the importance of blood transfusion in the therapy of erythroblastosis of newborn infants. Transfusion with Rh negative blood belonging to the O blood group or to the blood group of the infant should be administered.

Nordisk Medicin, Stockholm

22:1051-1106 (June 9) 1944

Renal Cancer, with Special Reference to Diagnosis. M. Bjørneboe.—p. 1051.
Puerperal Tetanus Following Criminal Abortion. T. B. Andersen and T. Øster.—p. 1057.
Solitary, Not Parasitic, Hepatic Cysts. H. F. Helweg-Larsen.—p. 1057.
Do Tubal Cells Occur in Endometrium? T. Hølund.—p. 1059.

Hygiea

Introductory Investigations on Disturbances in Daily Periodicity of Chloride Elimination in Depressive Psychoses. B. Bjerner.—p. 1061.
Abscess of Brain After Adenotomy. S. Dahlstedt.—p. 1069.
*Report Concerning Therapy in Cases of Infantile Paralysis. S. Backman.—p. 1072.
Clinical Determination of Albumin in Cerebrospinal Fluid. S. Izikowitz.—p. 1074.
Present Gonorrhea Problem. H. Haxthausen.—p. 1093.
Exercise Treatment in Thrombophlebitis in Lower Extremities. H. Heckscher.—p. 1094.

Therapy in Cases of Infantile Paralysis.—Backman advocates early short wave therapy in poliomyelitis as a natural method believed to act favorably on contractures and rigidity as well as on pain. Parallel attempts with this simple treatment and the more laborious Kenny method are suggested.

22:1107-1150 (June 16) 1944. **Partial Index**

Origin and Further Fate of Urobilinoids in Organism: Review. T. K. With.—p. 1107.

Hospitalstidende

Fractionated Spinal Anesthesia According to Sobrechts. A. R. Madsen.—p. 1113.
*Paroxysmal Paralytic Hemoglobinuria. A. Louw and H. E. Nielsen.—p. 1116.
Studies on Vesicles in Zoster and Chickenpox. S. Dahl.—p. 1120.

Finska läkaresällskapets handlingar

Polycythemia, Anemia and Calcified Spleen in Same Patient. Peculiar Hematologic Case. J. Forsell.—p. 1123.

Hygiea

Breaking Down of Fats in Organism. A. Gammeltoft.—p. 1135.
Possibility of Transmission of Syphilis by Transfusion Preparation. B. Swedberg and G. Widström.—p. 1138.
So-Called Myalgic Points of Pressure in Ischialgia. E. Sahlgren and O. Sjöqvist.—p. 1141.

Paroxysmal Paralytic Hemoglobinuria.—Louw and Nielsen found only 4 cases of paroxysmal paralytic myoglobinuria in the literature. Their case, the first in the Scandinavian literature, was in a boy aged 10, with history of repeated attacks of muscular pain and difficulty in walking since the age of 4, who was admitted for treatment during an acute attack. Spectroscopy showed excretion of myoglobin during the attack, when there was also pronounced creatinuria. The establishment of 8 cases of progressive muscular dystrophy in the boy's family suggests that this disorder and paralytic myoglobinuria may be different forms of the same condition, the latter representing the acute manifestation, the progressive muscular dystrophy the chronic form.

Book Notices

Penicillin Therapy Including Tyrothricin and Other Antibiotic Therapy. By John A. Kolmer, M.S., M.D., Dr. P.H., Professor of Medicine in the School of Medicine and the School of Dentistry, Temple University, Philadelphia. Fabrikoid. Price, $5. Pp. 302, with 22 illustrations. New York & London: D. Appleton-Century Company, 1945.

This monograph constitutes an attempt to correlate the available information on penicillin and other antibiotic agents for the medical and dental professions. With more and more penicillin becoming available for clinical use and with an expanding interest being manifested in antibiotics, such a review is timely. Kolmer has compressed much useful information within the covers of this compact volume. The first half of the monograph is devoted to the basic principles of therapy with antibiotics, with emphasis being placed on penicillin. The section on the principles of penicillin therapy summarizes the present status of the subject very well. In the sections devoted to the clinical use of penicillin for specific infectious diseases some of the recommendations will not be generally accepted. As an example, in the treatment of staphylococcic septicemia Kolmer advises that sulfathiazole should be administered simultaneously with penicillin. It remains to be proved whether this routine therapeutic combination has any advantage over the use of penicillin alone. Certainly there is the disadvantage that sulfathiazole not infrequently causes undesirable reactions and complications. One would also question the advisability of administering staphylococcus vaccine or toxoid to patients who have recovered from cellulitis and carbuncles. It is of interest that the author favors the combined use of the sulfonamides and penicillin in the treatment of several other types of infectious diseases, including streptococcic septicemia. Kolmer favors heparin as an adjuvant therapeutic agent in the treatment of subacute bacterial endocarditis with penicillin. He also would utilize sulfonamide therapy with penicillin in the treatment of this disease. The reviewer is in agreement with his recommendation that sulfadiazine and penicillin should be employed in the therapy of pneumococcic meningitis. An interesting and important development has been the treatment of syphilis with penicillin. That no final conclusions can be drawn at present concerning the optimal doses and ultimate therapeutic effects are reflected in the author's presentation of the subject. He appears to favor the combined use of penicillin and oxophenarsine hydrochloride. It is obvious that the clinician will not feel too confident in employing penicillin for the therapy of syphilis after reading this section.

The monograph is concluded by a discussion of tyrothricin, gramicidin S, streptothricin, patulin, chlorophyll and streptomycin. In his endeavor Kolmer has reviewed the literature on the subject, and references are appended to each chapter. The number of illustrations is relatively small and are not all reproduced too well. The illustration on page 46 is worthless. For those who wish to familiarize themselves with the practical aspects of antibiotic therapy this monograph is recommended.

Constitutional Medicine and Endocrinology. Edited by E. Pulay, M.D., A. P. Cawadias, O.B.E., M.D., F.R.C.P. and P. Lansel, M.D. Volume I. Cloth. Price, 10s. 6d. Pp. 99. London: Frederick Muller Ltd., 1944.

This small volume consists of a series of essays on constitutional medicine in general and includes articles on addisonism or the hypotonic symptom complex, pathophysiology of the blood picture, hemopoiesis and constitution and the clinical aspect of the blood sedimentation rate. These are most inspiring and stimulating accounts of a dynamic, functional study of constitution and should be read widely by physiologists, internists and neuropsychiatrists. Their general trend may be gleaned by a quotation from the summary of the introductory article by Cawadias on constitutional medicine, metabolism and endocrinology: "Constitutional medicine, representing the contemporary conception of the internistic subspecialty known first as gastroenterology and metabolism and later as endocrinology and metabolism, is a well defined branch of internal medical research and practice distinct (with the reserve of overlapping inherent in the construction of medical specialties) from the other internistic subspecialties, neurology, cardiology, diseases of the chest, dermatology, epidemiology (fevers). Its object is the consideration in health and disease of the sum total of the chemical reactions through which the body utilizes protein, fat, carbohydrate, minerals and oxygen and of the regulators of these processes (digestive and nutritive regulators, genes, neuroendocrine system and general environmental factors). Its mode of approach to the patient consists in considering primarily the disturbance of the sum total of the biochemical processes and of their regulators, and from this point of departure considering the various organic localizations so as to arrive at the understanding of the whole of the patient and of the patient as a whole. It consists also in thinking not in terms of disturbance (hyperfunction, hypofunction, dysfunction) of a particular system or organ but of rupture of balance of the system integrating and correlating the body-mind. Its diagnostic technic is essentially clinical and in its general lines is based essentially on a careful history, symptomatology and consideration of the total reactions, instrumental and laboratory findings being assessed in the light of the total clinical picture, in the frame of the total reactions. Its therapeutic technic is based on the understanding of these total reactions and forms an endeavor to reestablish the balance of the system of integration of the body-mind through various psychotherapeutic, dietetic, physical and pharmacological procedures. Its special nosographical field is composed of the constitutional diseases known as endocrine-metabolic diseases, i. e. diseases predominantly of the regulators of the biochemical processes. These include the classical metabolic diseases, genetic diseases, neuroendocrine diseases and those digestive and renal disturbances connected with a neuroendocrine and metabolic imbalance. All these diseases must be approached with the special constitutional diagnostic and therapeutic technic, and not one of these groups can be separated from the general body of constitutional medicine."

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and Other Matters Connected with the Work of Surgical Dressers, House Surgeons, and Practitioners. Edited by Hamilton Bailey, F.R.C.S.Eng., Surgeon, Royal Northern Hospital, London. Fourteenth edition. Cloth. Price, $6. Pp. 628, with 724 illustrations. Baltimore: William Wood & Company, 1944.

This is the fourteenth edition of a book which has been popular and affectionately regarded in England since 1884. It appears now under the editorship of Hamilton Bailey, whose writings are highly thought of in present day surgical literature. The purpose of the work is and has been to serve as a practical guide to house officers and practitioners in the care of patients. It stresses, chiefly, minor surgical procedures, conditions encountered in the outpatient department and the preoperative and postoperative care of all types of surgical cases. The subject matter covered is extensive, authoritative and up to date. It is divided into eighty chapters written by forty-six contributors, all English, and naturally presents the accepted English point of view. The style and literary quality, in spite of the number of contributors, is uniform and terse and reads easily. A feature of this edition is the unusually large number of excellent and even beautiful illustrations, photographs, drawings and diagrams. These are intended to illustrate the technic pictorially, and they really do enhance the clarity of the text. This edition is an improvement on its predecessors, and the continued value and popularity of "Pye" is assured.

Contribuição ao estudo das gangrenas dos membros inferiores nos diabéticos. Por Hugo Ottati Perlingeiro. [Tese] Paper. Pp. 154, with 55 illustrations. Rio de Janeiro: Jornal do Commercio, Rodrigues & C., 1944.

In this monograph the author presents his experience in the diagnosis and management of diabetic patients with gangrene of the lower extremities. A detailed study of 39 cases is included. Oscillometric studies, histamine tests and Samuel's maneuver of induced plantar ischemia were carried out and found to be reliable. In order to rule out vascular spasm, Landis and Gibson's test and the intravenous injection of sodium nitrite were used, following the technic of Beck and Takats. The patients' conditions did not lend themselves to arteriography, although the author is aware of the value of this procedure in verifying the degree of diminution or occlusion of the arterial lumen.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PATERNITY TESTS

***To the Editor:*—Please advise necessary data and significance of tests required in legal paternity court procedure. Grouping: Rh positive and negative; Rh' positive and negative; Hr positive and negative; M positive; N positive and negative? Testimony accepted by physician as expert need not require actual performance of tests.** M.D., New York.

ANSWER.—The expert called to perform blood tests in cases of disputed parentage must first properly identify the persons presenting themselves for the examination. This is done by having each affix his or her signature to the report forms, at the same time taking a thumb print with the aid of an ink pad. In the case of infants, a foot print or hand print may be taken. Photographs are also acceptable for identification purposes. It is not necessary for all the persons to be tested at the same time, but if they are they should be requested to identify one another. The date when the blood samples are drawn should be recorded, and any persons accompanying those involved in the dispute may be asked to sign the report as witnesses.

Blood tests can be used only to exclude parentage; if the findings conform with the established laws of heredity, this merely means that the individuals in question could be the parents but need not necessarily be the parents. In instances in which an exclusion of paternity or maternity is obtained, it is good practice to repeat the examination on fresh blood samples. Some courts have such reports rechecked by an independent investigator. With the tests now available, a man falsely accused of paternity can be cleared in more than half the cases. A complete test nowadays would include the four blood groups, the subgroups of A and AB, the M-N types, the eight Rh types, the Hr factor, the P factor and the secretor type. Tests on the saliva for the secretor type are usually omitted, however, because the slight additional chance of excluding paternity it affords is not worth the effort entailed in getting the saliva samples (especially in infants) and in testing them. Also the P factor is hardly ever tested for because of the lack of sufficient potent antiserums. As for the remaining tests, the person performing the tests should limit himself only to those with which he has had sufficient experience. Thus the completeness of the report will vary throughout the country, because not every state has physicians specializing in this subject.

Exclusion of parentage results if one or more of the following laws is broken by the results of the tests:

Tests for the four blood groups O, A, B and AB: 1. Agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents. 2. Group AB parents cannot have group O children, and group O parents cannot have group AB children. Failure of the tests to conform with either of these two laws is absolute proof of nonparentage.

Subgroups of groups A and AB: 1. No child can belong to subgroup A_1 or A_1B unless one or both parents possess agglutinogen A_1. 2. Parents of subgroup A_1B cannot have A_2 children, and parents of subgroup A_2 cannot have A_1B children. The reliability of these tests is not as great as the common blood grouping tests for the following reasons: 1. The subgroups are not fully developed at birth and are difficult to determine reliably until the infant is at least 1 month old. 2. Bloods exist which give reactions intermediate between A_1 and A_2, especially among Negroes. 3. The subgrouping serums give much weaker reactions than the better anti-A and anti-B serums, so reliable results are possible only with considerable experience. Exclusion of parentage by the subgroups should therefore be considered evidence only that parentage is highly improbable and not necessarily impossible.

Types M, N and MN: 1. The agglutinogens M and N cannot appear in the blood of a child unless present in the blood of one or both parents. 2. Type M parents cannot have type N children, and type N parents cannot have type M children. More experience is required for the accurate performance of these tests than for the common blood grouping tests. In the hands of experts, exclusions based on the M-N tests are absolute proof of nonparentage.

Rh types and Hr factor: 1. The factors Rh_0, Rh', Rh" and Hr cannot appear in the blood of a child unless present in one or both parents. 2. Hr-negative parents cannot have children of types Rh_2, Rh", Rh_0 and Rh negative, and parents of types Rh_2, Rh", Rh_0 and Rh negative cannot have Hr-negative children. When the tests are performed by experts, exclusions of parentage based on these new tests are fully as reliable as exclusions based on the common blood grouping tests.

No expert should testify on the basis of tests performed by another person but should insist on performing the tests himself before offering an opinion. In this way he would not assume responsibility for technical or clerical errors of some other individual but would base his conclusions on his own observations. If this is not possible he should qualify his conclusions, depending on the experience and reliability of the person who actually carried out the examination.

Under the present legal system these tests have the same standing in court as any other evidence introduced, and the judge and jury can give them as much or as little weight as they see fit. In states where blood test laws have been passed, the laws give the courts the power to compel persons involved in paternity disputes to submit to blood tests, on application by any party in the action, but the laws do not compel the acceptance of conclusions based on the tests once these have been performed. Therefore, scientific proof of nonpaternity does not guarantee a just verdict, because the verdict in some courts also depends on certain intangible factors, such as the manner in which the lawyer and the physician present the facts to judge and jury, the impression made by the defendant when he testifies, prejudices in the mind of judge or jury against dissolving a marriage, and sympathy for woman and child. In New York City the tests are performed most often for paternity disputes before the Court of Special Sessions, and in an experience with many hundred examinations, conclusions based on the blood tests have invariably been accepted as final.

References:

Wiener, A. S.: Blood Groups and Transfusion, ed. 3, Springfield, Ill., Charles C. Thomas, 1943.

Wiener, A. S.; Davidsohn, Israel, and Potter, Edith L.: Heredity of the Rh Blood Types: II. Observations on the Relation of the Hr Factor to the Rh Blood Types, J. Exper. Med. **81**: 63 (Jan.) 1945.

Wiener, A. S., and Sonn, E. B.: Heredity of the Rh Blood Types: IV. Medicolegal Application in Cases of Disputed Parentage, J. Lab. & Clin. Med. **30**: 395 (May) 1945.

URINARY INCONTINENCE FOLLOWING HYSTERECTOMY

***To the Editor:*—About three months ago I did a hysterectomy on a young woman. She made a splendid and satisfactory recovery from her operation and left the hospital about the twenty-first postoperative day, going home apparently well and in good condition. About a week later, four weeks following her operation, she woke up one night and found her bed quite wet and has continued to pass urine ever since. She returned to the hospital about ten days ago; after thorough examination and injection of methylene blue into the bladder, a diagnosis of urethral incontinence was made. Retention catheters have been used and posterior pituitary injection 0.5 cc. has also been given in an endeavor to tighten up the bladder muscles. She has made little or no improvement under this regimen.** R. E. Stivison, M.D., Topeka, Kan.

ANSWER.—Urethral urinary incontinence such as described is probably due to increased sagging of the bladder from a cystourethrocele which may have been present in lesser degree prior to the hysterectomy. For this there is no satisfactory treatment other than a vaginal correction of the cystocele together with reinforcement of the musculofascial supports of the urethra, preferably with sutures of fine silk. It is important to make certain that the incontinence is solely from the urethra, not from a vesical or urethral fistula. Further, before proceeding to operation it is always necessary to rule out incontinence ascribable to tabes or other cord lesions.

CONTACT ULCER OF LARYNX

***To the Editor:*—What is the best treatment, including climatic treatment, for contact ulcer of the larynx?** M. C., A. U. S.

ANSWER.—"Contact ulcer of the larynx" refers to a superficial ulceration localized in the region of one or both vocal processes and involving the underlying cartilage. The chief predisposing cause is considered to be excessive or faulty use of the voice. The recommended treatment includes strict limitation of the voice to a few words a day for a prolonged period, sometimes several months. Removal of granulomatous tissue and superficial trimming of the ulcerated area with sharp cup forceps aids healing and permits biopsy. A warm moist climate is considered preferable to dry air. Other factors to be considered are the correction of faulty methods of voice production, elimination of chronic sinus or throat infection and avoidance of tobacco and alcohol.

INTRAVENOUS UROGRAPHY

To the Editor:—What are the contraindications to intravenous urography? What technical errors and pathologic conditions produce an absent or subnormal dye concentration in the intravenous urogram?

M.D., New York.

ANSWER.—Excretory (intravenous) urography may be contraindicated because of (1) extreme debility, (2) advanced age or (3) the presence of renal insufficiency. In individuals who have a known idiosyncrasy to iodine, the contrast medium should be administered slowly and in limited amounts. However, in most cases the organic form of iodine in the contrast medium causes comparatively little reaction.

Absence or subnormal concentration of the opaque medium in the excretory urogram may be caused either by technical errors or by pathologic renal lesions. The following technical errors may interfere with visualization of the urinary tract adequate for accurate interpretation: (1) inadequate preroentgenographic preparation of the patient, with resulting obscuration of the areas included in the urinary tract, (2) hyperperistalsis with very fragmentary visualization of any portion of the renal pelves or ureters and (3) inadequate amounts of medium injected intravenously, either because of intolerance on the part of the patient or because of diffusion of the injected medium into the extravenous tissues.

The pathologic conditions in the urinary tract which may prevent adequate visualization are (1) reflex inhibition of secretion in the presence of stone in either the kidney or ureter, (2) ureteral obstruction, such as occurs with hydronephrosis or subsequent to obstructing neoplasm in the kidney, ureter or bladder, (3) failure of excretion of the contrast medium caused by various pathologic lesions such as congenital hypoplasia, acquired renal atrophy, diffuse unilateral pyelonephritis, renal tumor and renal tuberculosis, and (4) congenital anomaly such as renal agenesia.

Failure of visualization in one kidney is sometimes observed without one's being able to determine any etiologic factor. Occasionally the renal pelves may not be visualized in one excretory urogram, but when repeated several days later a normal or slightly subnormal visualization may be present for which no adequate reason may be apparent.

A difference in the degree of visualization of the two kidneys is quite common and it may be difficult to determine the cause. Minor differences in degree of visualization may be of no clinical significance. However, when there is a constant, definite difference in concentration of the dye in the two kidneys or ureters, with some increase in size of the renal pelves, calices or ureters, some cause of the stasis usually is present as the result of active or recent factors.

ARTIFICIAL FINGER

To the Editor:—A young woman who is a pianist has lost the distal half of her right index finger. She is anxious to have the missing part artificially restored to enable her to follow her art. Is such a prosthetic restoration available or practical, and if so where can it be obtained?

Charles F. Noe, M.D., Amana, Iowa.

ANSWER.—The loss of only a portion of one finger ordinarily incapacitates a person so little that a prosthesis is not necessary. Most persons so afflicted will not use a prosthesis except for cosmetic reasons, as it interferes with function of the other fingers. The use of such an appliance in an art requiring the sense of touch and pressure and rapidly integrated motions would probably be a detriment rather than an aid.

Prostheses of plastics and latex of good cosmetic quality are available through such manufacturers as the John J. McCann Company of Burlington, N. J., and the John Eschen Company of New York.

MYDRIATIC FOR EXAMINATION OF FUNDUS

To the Editor:—What is the best and safest mydriatic for a general practitioner to use to examine the fundus? It should be quick acting and of short duration.

Joseph P. Sparks, M.D., Manito, Ill.

ANSWER.—A 2 per cent solution of euphthalmine, one drop in the eye every five minutes for two to four instillations, is recommended. Mydriasis is obtained in twenty to thirty minutes, sufficient for a thorough examination of the fundus. One of the great advantages of this drug is that there is but little effect on the ciliary muscle of accommodation (cycloplegic effect) and consequently the patient is not discommoded visually. But it must not be forgotten that the pupil must be contracted with 2 per cent solution of pilocarpine after the examination is completed to avoid the danger of acute glaucoma.

PROBABLE ATOPIC ECZEMA

To the Editor:—A man aged 21, 5 feet 10 inches (178 cm.) in height, and weighing 133 pounds (60 Kg.), has had a dry and cracking skin almost all his life. He has multiple skin reactions, but too many to be true allergies. Dietary treatment has been tried for a long time with no benefit. This last year his hay fever and asthma were controlled by "shots." In previous years he had reactions without adequate protection. He is just getting over a siege of impetiginous infection with fever which responded well to penicillin. The main problem is a tough dry skin. What is recommended for improving the condition of the oil and sweat glands? I would appreciate references. Intake of fats and oils has not helped.

L. E. Blachman, M.D., Cleveland Heights, Ohio.

ANSWER.—From the information given it would seem that this young man has had a generalized dryness and cracking of the skin all his life. Nothing is said about any localization or whether there is any relief during warm weather. The absence of this information suggests that the patient has a xeroderma or ichthyosis. Multiple skin reactions are spoken of and it could be assumed that these were responses to skin tests, but the ichthyotic skin, as a rule, does not give any such reactions. The history of hay fever and asthma suggests the probability of an atopic eczema. The impetiginous infection could be an infection of the excoriations of the latter disease. Atopic eczema is usually a flexural condition, although it can be generalized. It is usually worse in cold weather and has a history of asthma and hay fever in the individual and also in the family.

The condition is an extremely obstinate one and is often an individual problem because the patient frequently has numerous sensitivities to external and internal agents. The condition is well discussed in Becker and Obermayer's Dermatology under the heading of Neurodermatitis. These patients are often sensitive to soap and wool externally and possibly to eggs, chocolate and other agents in the food. The taking of fats and oils will not contribute to the relief of the dryness. The therapy problem is such an individual one that it would be difficult to outline specific treatment in this instance.

WATERY CYSTS OF CONJUNCTIVA

To the Editor:—What is the proper term for the small watery cysts which appear at the palpebral fissure in the conjunctiva over the sclera and consist of little blebs filled with water? They sometimes are single and sometimes appear in a string of four or five or six, each perhaps the size of a pinhead. Sometimes there are as many as ten to a hundred, usually all connected. When one is snipped off all, as a rule, are empty.

F. P. Thompson, M.D., Chicago.

ANSWER.—Such cysts are not uncommon and are usually seen in connection with a mild chronic catarrhal form of conjunctivitis. No particular name has ever been assigned to the condition, although it is described by W. Stewart Duke-Elder (Text-Book of Ophthalmology, St. Louis, C. V. Mosby, 1938, vol. II, p. 1773). As a rule, such cysts lie in the temporal portion of the palpebral fissure, most frequently below the midline, and usually disappear spontaneously as the conjunctivitis is relieved.

DERMATITIS FROM DIESEL FUEL OIL

To the Editor:—Having observed cases of dermatitis apparently caused by contact with fuel oil used in Diesel engines, I wish to learn if there is any prophylactic measure which can be taken to avoid this.

M. A. Stivers, M.D., Middletown, N. Y.

ANSWER.—Fuel oil used in Diesel engines can cause dermatitis by the fat solvent action on the skin of the light petroleum distillates which it contains; it may cause folliculitis and oil acne because of its content of the heavy petroleum distillates.

Prophylactic measures are directed toward keeping the oil off the skin or, if this cannot be done, allowing the oil to remain on the skin for as short a time as possible.

Protective clothing in the form of oil proof rubber gauntlets, oil impervious sleeves and aprons will keep the oil off the skin. Frequent washing of the hands and forearms, compulsory shower baths after work and a daily change to clean work clothes will reduce the time the oil comes in contact with the skin.

The use of suitable protective ointments on the exposed parts gives some safeguard. An ointment with a lanolin base tends to buffer the solvent action on the skin of the light petroleum distillates. An ointment leaving a dry oil repellent film on the skin tends to minimize contact with the oil. Such ointments are on the market.

Reference:

Schwartz, Louis: Protective Ointments and Industrial Cleansers, M. Clin. North America **26**: 1195 (July) 1942.

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JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, MAY—AUGUST 1945

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1933. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acta chirurgica Scandinavica. Stockholm.
Acta dermato-venereologica. Stockholm.
Acta medica scandinavica. Stockholm.
Acta psychiatrica et neurologica. Copenhagen.
Acta radiologica. Stockholm.
American Heart Journal. St. Louis.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Cincinnati.
American Journal of Pathology. Ann Arbor, Mich.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Review of Soviet Medicine. New York.
American Review of Tuberculosis. New York.
Anesthesiology. New York.
Annals of Allergy. Minneapolis.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Annals of Tropical Medicine. Liverpool.
Archiv für klinische Chirurgie. Berlin.
*Archives of Dermatology and Syphilology. A. M. A., Chicago.
*Archives of Internal Medicine. A. M. A., Chicago.
*Archives of Neurology and Psychiatry. A. M. A., Chicago.
*Archives of Ophthalmology. A. M. A., Chicago.
*Archives of Otolaryngology. A. M. A., Chicago.
*Archives of Pathology. A. M. A., Chicago.
Archives of Physical Medicine. Chicago.
*Archives of Surgery. A. M. A., Chicago.
Archivos de neurocirurgia. Buenos Aires.
Archivos uruguayos de medicina, cirugia y especialidades. Montevideo.
Arizona Medicine. Phoenix.
Australian Journal of Experimental Biology & Medical Science. Adelaide.
Australian and New Zealand Journal Surgery. Sydney.
Brain. London.
British Heart Journal. London.
British Journal of Dermatology and Syphilis. London.
British Journal of Experimental Pathology. London.
British Journal of Industrial Medicine. London.
British Journal of Ophthalmology. London.
British Journal of Radiology. London.
British Journal of Surgery. Bristol.
British Journal of Tuberculosis. London.
British Journal of Urology. London.
British Journal of Venereal Diseases. London.
British Medical Journal. London.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the Los Angeles Neurological Society. Los Angeles.
Bulletin of the New York Academy of Medicine. New York.
Bulletin of the U. S. Army Medical Department. Washington, D. C.
California and Western Medicine. San Francisco.
Canadian Journal of Public Health. Toronto.
Canadian Medical Association Journal. Montreal.
Cancer Research. Baltimore.
Chinese Medical Journal. Washington, D. C.
Chirurg. Berlin.
Connecticut State Medical Journal. Hartford.
Delaware State Medical Journal. Wilmington.
Deutsche medizinische Wochenschrift. Leipzig.
Deutsche Zeitschrift für Chirurgie. Berlin.
Diseases of Chest. Chicago.
Edinburgh Medical Journal.
Endocrinology. Springfield, Ill.
Epidemiological Information Bulletin. Washington, D. C.
Gastroenterology. Baltimore.
Hawaii Medical Journal. Honolulu.
Illinois Medical Journal. Chicago.
Indian Medical Gazette. Calcutta.
Journal of Allergy. St. Louis.
Journal of the Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bone and Joint Surgery. Boston.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. Boston.
Journal of Endocrinology. London.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Industrial Hygiene and Toxicology. Baltimore.
Journal of Infectious Diseases. Chicago.
Journal of International College of Surgeons. Chicago.
Journal of Investigative Dermatology. Baltimore.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal-Lancet Minneapolis.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.
Journal of the Missouri State Medical Association. St. Louis.
Journal of the Mount Sinai Hospital. New York.
Journal of the National Cancer Institute. Washington, D. C.
Journal National Malaria Society. Tallahassee, Fla.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology, Neurosurgery and Psychiatry. London.
Journal of Neuropathology and Experimental Neurology. Baltimore.
Journal of Neurophysiology. Springfield, Ill.
Journal of Neurosurgery. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynaecology of British Empire. Manchester.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
Journal of Physiology. Cambridge
Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Urology. Baltimore.
Kentucky Medical Journal. Bowling Green.
Khirurgiya, Moscow.
Klinicheskaya meditsina. Moscow.
Klinische Wochenschrift. Berlin.
Lancet. London.
Laryngoscope. St. Louis.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina Española. Madrid.
Medicine. Baltimore.
Medizinische Klinik. Berlin.
Military Surgeon. Washington, D. C.
Minnesota Medicine. St. Paul.
Münchener medizinische Wochenschrift. Munich.
Nebraska State Medical Journal. Lincoln.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal.
New York State Journal of Medicine. New York.
Nordisk medicin. Stockholm.
North Carolina Medical Journal. Winston-Salem.
Northwest Medicine. Seattle.
Obstetricia y ginecologia latino-americanas. Buenos Aires.
Ohio State Medical Journal. Columbus.
Pediatria e puericultura. Bahia.
Pennsylvania Medical Journal. Harrisburg.
Physiological Reviews. Baltimore.
Policlinico (Sez. Prat.). Rome.
Practitioner. London.
Prensa Médica Argentina. Buenos Aires.
Proceedings of Royal Society of Medicine. London.
Psychoanalytic Quarterly. Albany, N. Y.
Psychosomatic Medicine. Baltimore.
Public Health Reports. Washington, D. C.

*Cannot be lent.

Puerto Rico J. Public Health & Tropical Medicine. San Juan.
Quarterly Journal of Medicine. Oxford.
Quarterly Journal of Studies on Alcohol. New Haven, Conn.
Radiology. Syracuse, N. Y.
Review of Gastroenterology. New York.
Revista chilena de pediatría. Santiago.
Revista de la Policlínica Caracas. Caracas.
Rhode Island Medical Journal. Providence.
Rocky Mountain Medical Journal. Denver.
Semana Médica. Buenos Aires.
South African Journal of Medical Sciences. Johannesburg.
South African Medical Journal. Cape Town.
Southern Medical Journal. Birmingham, Ala.
Sovetskaya meditsina. Moscow.
Surgery. St. Louis.
Surgery, Gynecology and Obstetrics. Chicago.
Texas State Journal of Medicine. Fort Worth.
Transactions of the Royal Society of Tropical Medicine and Hygiene. London.
Union Médicale du Canada. Montreal.
United States Naval Medical Bulletin. Washington, D. C.
Virginia Medical Monthly. Richmond.
*War Medicine. A. M. A., Chicago.
Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.
West Virginia Medical Journal. Charleston.
Wiener klinische Wochenschrift. Vienna.
Wisconsin Medical Journal. Madison.
Yale Journal of Biology and Medicine. New Haven.

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SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. in the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

For author index see page 1304.

A

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Acad.—Academy
Am.—American
A.—Association
Coll.—College
Commn.—Commission
Comm.—Committee
Conf.—Conference
Cong.—Congress
Dist.—District
Found.—Foundation
Hosp.—Hospital
Indust.—Industrial
Internat.—International
M.—Medical
Med.—Medicine
Nat.—National
Pharm.—Pharmaceutical
Phys.—Physicians
Soc.—Society
Surg.—Surgery
Surgs.—Surgeons
S.—Surgical

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